Vol. 1018 Number 3

OFFICIAL GAZETTE

of the

UNITED STATES PATENT AND TRADEMARK OFFICE

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PATENTS

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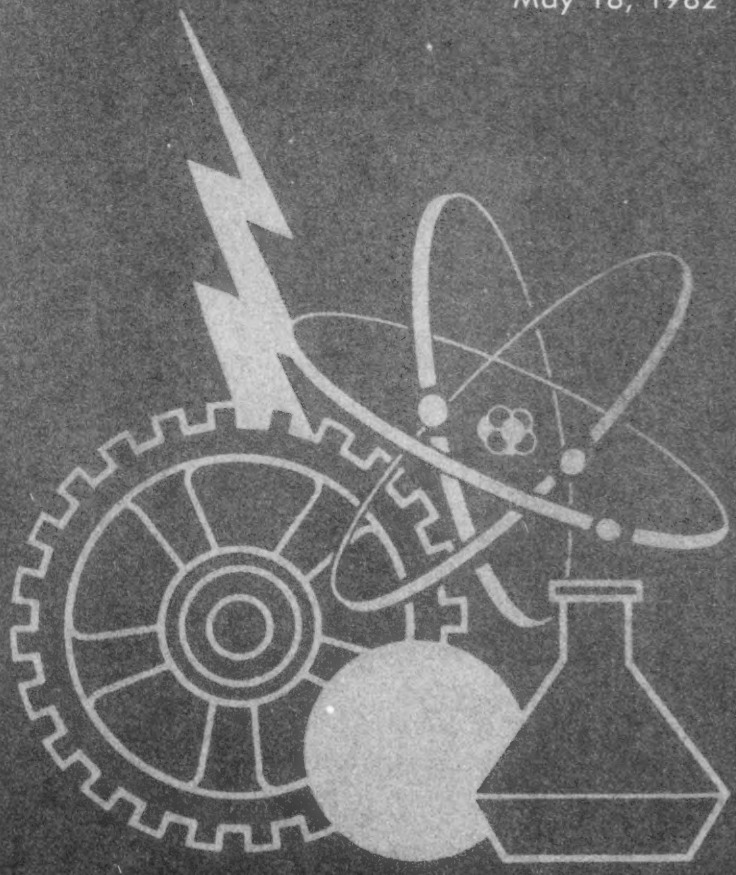

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May 18, 1982 Volume 1018 Number 3

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PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty Information

For information concerning the PCT member countries and the most recent PCT rule changes see the notices appearing in the Official Gazette at 1001 O.G. 14 on Dec. 9, 1980 and at 1012 O.G. 20 on Nov. 17, 1981.

Note that the international fees have been increased as of Jan. 1, 1982. The current schedule of fees is as follows:

Transmittal fee	$ 35.00
Search fee	300.00
International Fees	
Basic Fee (first 30 pages)	270.00
Basic Supplemental Fee (for each sheet over 30)	6.00
Designation Fees	65.00

GERALD J. MOSSINGHOFF,
Jan. 19, 1982. *Commissioner of Patents and Trademarks.*

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

4,169,913, Re. S.N. 270,832, Filed June 5, 1981, Cl. 428/217, COATED TOOL STEEL AND MACHINING TOOL FORMED THEREFROM, Mitsunori Kobayashi, et al., Owner of Record: *Sumitomo Electric Industries, Ltd., Osaka, Japan,* Attorney or Agent: John E. Lind, et al., Ex. Gp.: 164

4,190,067, Re. S.N. 347,199, Filed Feb. 9, 1982, Cl. 139/435, METHOD AND APPARATUS FOR INSERTION OF WEFT THREADS IN JET WEAVING MACHINES, Vladimir Kuda, et al., Owner of Record: *Vyzkumny A Vyvojovy Ustav Zavodu Vseobecneho Strojirenstvi, Brno, Czechoslovakia,* Attorney or Agent: Arthur O. Klein, et al., Ex. Gp.: 353

4,242,061, Re. S.N. 360,351, Filed Mar. 22, 1982, Cl. 417/536, DOUBLE DIAPHRAGM PUMP, E. Dale Hartley, Owner of Record: *Inventor,* Attorney or Agent: Gordon L. Peterson, Ex. Gp.: 343

4,253,017, Re. S.N. 349,444, Filed Feb. 17, 1982, Cl. 235/449, MAGNETICALLY CODED IDENTIFICATION CARD, Edwin N. Whitehead, Owner of Record: *Inventor,* Attorney or Agent: William D. Hall, Ex. Gp.: 235

4,263,523, Re. S.N. 360,234, Filed Mar. 22, 1982, Cl. 307/419, PULSE GENERATOR USING READ HEAD WITH WIEGAND WIRE, John R. Wiegand, Owner of Record: *The Echlin Manufacturing Co., Branford, Conn.,* Attorney or Agent: Lloyd McAulay, et al., Ex. Gp.: 235

4,291,391, Re. S.N. 351,044, Filed Feb. 22, 1982, Cl. 365/184, TAPER ISOLATED RANDOM ACCESS MEMORY ARRAY AND METHOD OF OPERATING, Pallab K. Chatterjee, et al., Owner of Record: *Texas Instruments, Inc., Dallas, Tex.,* Attorney or Agent: Robert Groover, III, Ex. Gp.: 235

REQUESTS FOR REEXAMINATION FILED

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.21(b)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b).

4,219,126 Reexam. No. 90/000,126, Requested: Apr. 14, 1982, Cl. 220/89A SAFE CARTRIDGE FOR GAS, Katsuo Oana, Owner of Record: *Inventor,* Attorney or Agent: Haseltine, Lake & Waters, Ex. Gp.: 241, Requester: Wegner & Bretschneider, Washington, D.C.

Removal From Register

Pursuant to the provision of 37 C.F.R. §1.347, a letter was directed on Nov. 18, 1981, to the last post office address furnished to the Committee on Enrollment by each of the persons whose name and address appear on the following list. With respect to some of the letters, no reply was received within the period of forty-five (45) days therein set. Other letters were returned by the Post Office with notations to the effect that the addressee was deceased, unknown, or had moved and left no forwarding address.

Accordingly, the names of the following persons have been removed from the Register of Patent Attorneys and Patent Agents.

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Apr. 21, 1982. *Chairman, Committee on Enrollment.*

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Notice of Recordation of Trade Name

"Bristol-Myers Company"

On Feb. 3, 1982, there was published in the Federal Register (47 FR 5063), a notice of application for the recordation under section 42 of the Act of July 5, 1946, as amended (15 U.S.C. 1124), of the trade name "BRISTOL-MYERS COMPANY." The notice advised that prior to final action on the application, filed pursuant to section 133.12, Customs Regulations (19 CFR 133.12), consideration would be given to relevant data, views, or arguments submitted in opposition to the recordation and received not later than 60 days from the date of publication of the notice. No responses were received in opposition to the application.

The name "BRISTOL-MYERS COMPANY" is hereby recorded as the trade name of Bristol-Myers Company, a corporation organized under the laws of the State of Delaware, located at 345 Park Ave., New York, N.Y. 10154. The trade name is used in connection with the following merchandise manufactured in numerous foreign countries: pharmaceuticals and medicines for human and veterinary use; vitamins, deodorants and oral hygiene preparations for human use; cosmetics and toiletries; medical appliances; small electrical appliances; and nutritional foods.

DONALD W. LEWIS,
Apr. 14, 1982. *Director, Entry Procedures and Penalties Division.*

Notice of Recordation of Trade Name

"Clairol Incorporated"

On Feb. 3, 1982, there was published in the Federal Register (47 FR 5063), a notice of application for the recordation under section 42 of the Act of July 5, 1946, as amended (15 U.S.C. 1124), of the trade name "CLAIROL INCORPORATED." The notice advised that prior to final action on the application, filed pursuant to section 133.12, Customs Regulations (19 CFR 133.12), consideration would be given to relevant data, views, or arguments submitted in opposition to the recordation and received not later than 60 days from the date of publication of the notice. No responses were received in opposition to the application.

The name "CLAIROL INCORPORATED" is hereby recorded as the trade name of Clairol Incorporated, a corporation organized under the laws of the State of Delaware, located at 345 Park Ave., New York, N.Y. 10154. The trade name is used in connection with the following merchandise which is manufactured in numerous foreign countries: hair coloring, hair care products, electrical appliances, cosmetics and toiletries.

DONALD W. LEWIS,
Apr. 14, 1982. *Director, Entry Procedures and Penalties Division.*

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The U.S. Patent and Trademark Office and Intellectual Property Owners, Inc. are jointly instituting an education program for patent examiners to increase their awareness of industrial technology, particularly in rapidly advancing industrial fields. The program is expected to benefit the patent system and its users by improving the quality of patent examining, resulting, in turn, in the issuance of higher quality patents.

Under the joint program, costing about $350,000 annually, each patent examiner will be given an opportunity to spend up to a week once every three years in visit-

ing commercial and industrial installations which industry makes available for this purpose. The cost of the program will be defrayed by contributions from industry. However, to avoid even the slightest possibility that contributors might influence Patent and Trademark Office decisions in specific applications, the contributors' identities will be kept from patent examiners who visit commercial or industrial facilities, and those who designate examiners for specific trips.

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GERALD J. MOSSINGHOFF,
Apr. 27, 1982. *Commissioner of Patents and Trademarks.*

Simulated or Predicted Tests or Examples

In order to provide for uniform practice before the Patent and Trademark Office, the following clarification of current Office practice relating to simulated or predicted tests or examples is being set forth. This notice specifies the Office policy which is currently in effect and is considered to have been in effect in the past in this area. The wording of the MPEP provisions prior to this amendment went further than was intended. The amended sections below spell out more clearly the Office's position from the start.

The following wording will be substituted in revision number 8 for that presently in paragraph D of section 608.01(p) of the Manual of Patent Examining Procedure.

MPEP §608.01(p)

"D. Simulated or Predicted Test Results or Prophetic Examples

Simulated or predicted test results and prophetical examples (paper examples) are permitted in patent applications. Working examples correspond to work actually performed and may describe tests which have actually been conducted and results that were achieved. Paper examples describe the manner and process of making an embodiment of the invention which has not actually been conducted. Paper examples should not be represented as work actually done. No results should be represented as actual results unless they have actually been achieved. Paper examples should not be described using the past tense."

The first and last paragraphs of MPEP section 707.07(1) are being deleted.

DONALD J. QUIGG,
Apr. 15, 1982. *Deputy Commissioner of Patents and Trademarks.*

Errata

"All reference to Patent No. D263,924 to Kenneth R. Hinshaw of Calif. for FIRE SCREEN appearing in the Official Gazette of Apr. 20, 1982 should be deleted since no patent was granted".

"All reference to Patent No. 4,319,986 to William A. Romanauskas of Conn. for METHOD AND APPARATUS FOR IMPROVING SEDIMENTATION FIELD FLOW FRACTIONATION CHANNELS appearing in the Official Gazette of Mar. 16, 1982 should be deleted since no patent was granted".

"All reference to Patent No. 4,324,733 to Donald W. Graham, Edward F. Rogers and Frederick M. Kahan all of N.J. for RENAL DIPEPTIDASE INHIBITORS appearing in the Official Gazette of Apr. 13, 1982 should be deleted since no patent was granted".

"All reference to Patent No. 4,326,083 to Wilbur H. McKellin of Ill. for PROCESS FOR MAKING HALOALKYTRIALKOXYPHENONE appearing in the Official Gazette of Apr. 20, 1982 should be deleted since no patent was granted".

National Technical Information Service

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Please cite the number and title of inventions of interest.

DOUGLAS J. CAMPION,
Program Coordinator,
Office of Government Inventions and Patents
National Technical Information Service
U.S. Department of Commerce.

SN 6-364,944. ROTATING TOOL WEAR MONITORING APPARATUS. Filed Apr. 2, 1982 by Dept. of Commerce. Inventor: *Kenneth W. Yee, et al.*

SN 6-037,242. LABORATORY PESTICIDE SPRAY CHAMBER. Filed May 9, 1979 by Dept. of Agriculture. Patent 4,318,363 issued Mar. 9, 1982. Inventor: *Emanuel Moellman, et al.*

SN 6-078,745. METHOD INCREASING THE YIELD OF HYDROCARBONS FROM PLANTS. Filed Sept. 25, 1979 by Dept. of Agriculture. Patent 4,322,242 issued Mar. 30, 1982. Inventor: *Henry Yokoyama, et al.*

SN 6-105,079. DETECTION OF MALIGNANT LESIONS OF THE ORAL CAVITY UTILIZING TOLUIDINE BLUE RINSE. Filed Dec. 19, 1979 by DHHS. Patent 4,321,251 issued Feb. 23, 1982. Inventor: *Arthur Mashberg.*

SN 6-132,027. DIRECTION FINDING SYSTEM. Filed Mar. 20, 1980 by FCC. Patent 4,318,106 issued Mar. 2, 1982. Inventor: *Arthur Lueditke.*

SN 6-132,583. VACUUM-OPERATED PRODUCE HANDLING SYSTEMS. Filed Mar. 21, 1980 by Dept. of Agriculture. Patent 4,320,995 issued Mar. 23, 1982. Inventor: *Bernard Tennes, et al.*

SN 6-175,594. METHOD FOR THE USE OF ORALLY ADMINISTERED 13-CIS-RETINOIC ACID IN THE TREATMENT OF ACNE. Filed Aug. 5, 1980 by Dept. of HHS. Patent 4,322,438 issued Mar. 30, 1982. Inventor: *Gary L. Peck.*

SN 6-187,380. APPARATUS FOR REMOVING CORN FROM COB. Filed Sept. 15, 1980 by Dept. of Agriculture. Patent 4,318,415 issued Mar. 9, 1982. Inventor: *George H. Robertson, et al.*

SN 6-217,143. EVERTING TUBE DEVICE WITH RELATIVE ADVANCE CONTROL. Filed Dec. 16, 1980 by DHHS. Patent 4,321,915 issued Mar. 30, 1982. Inventor: *Stephen Leighton, et al.*

SN 6-230,498. METHOD AND APPARATUS FOR PREPARATION COUNTERCURRENT CHROMATOGRAPHY EMPLOYING A ROTATING COLUMN ASSEMBLY. Filed Feb. 2, 1981 by DHHS. Patent 4,321,138 issued Mar. 23, 1982. Inventor: *Yoichiro Ito.*

SN 6-263,823. CONVERSION OF CYCLOPROPENOIDS TO CONJUGATED DIENE AND SATURATED DERIVATIVES. Filed May 15, 1981 by Dept. of Agriculture. Patent 4,321,210 issued Mar. 23, 1982. Inventor: *Yoshinori Kai, et al.*

SN 6-325,730. HYDROCEPHALIC ANTENATAL VENT FOR INTRAUTERINE TREATMENT. Filed Nov. 30, 1981 by Dept. of HHS. Inventor: *Wellner, et al.*

SN 6-050,100. ANTI-NEOPLASTIC 1,4-BIS-(SUBSTITUTED AMINOALKYL AMINO)-ANTHRAQUINONES. Filed June 19, 1979 by Dept. of HHS. Patent 4,310,666 issued Jan. 12, 1982. Inventor: *Robert K. Zee-Cheng, et al.*

SN 6-075,385. OPEN SURFACE FLOTATION METHOD. Filed Sept. 13, 1979 by Dept. of Interior. Patent 4,302,051 issued Mar. 24, 1981. Inventor: *Dan M. Bass, et al.*

SN 6-085,450. MODIFIED SULFUR CEMENT. Filed Oct. 16, 1979 by Dept. of Commerce. Patent 4,311,826 issued Jan. 19, 1982. Inventor: *William C. McBee, et al.*

SN 6-092,102. POLYMER ALLOY BLOOD COMPATIBLE SURFACE. Filed Nov. 7, 1979 by Dept. of HHS. Patent 4,312,920 issued Jan. 26, 1982. Inventor: *William S. Pierce, et al.*

SN 6-114,536. MOUNTING BLOCK TO ROTATE COAL CUTTER BITS. Filed Feb. 23, 1980 by Dept. of Interior. Patent 4,302,053 issued Nov. 24, 1981. Inventor: *Wallace Roepke, et al.*

SN 6-118,959. TRIANGULAR SHAPED CUTTING HEAD FOR USE WITH A LONGWALL MINING MACHINE. Filed Feb. 6, 1980 by Dept. of Interior. Patent 4,303,277 issued Dec. 1, 1981. Inventor: *Wallace Roepke, et al.*

SN 6-126,108. ABSORBED DOSE WATER CALORIMETER. Filed Feb. 29, 1980 by Dept. of HHS. Patent 4,312,224 issued Feb. 26, 1982. Inventor: *Steve R. Domen.*

SN 6-134,008. CONTROL OF PARASITIC TICKS. Filed Mar. 26, 1980 by Dept. of Agriculture. Patent 4,310,547 issued Jan. 12, 1982. Inventor: *LaWanda Hunt, et al.*

SN 6-147,690. METHOD FOR MEASURING THE IONIC ACTIVITIES IN WATER WITH A DIFFERENTIAL PRESSURE TRANSDUCERS. Filed May 7, 1980 by Dept. of Interior. Patent 4,301,676 issued Nov. 24, 1981. Inventor: *Nev A Gokcen.*

SN 6-206,246. AMINE FLOTATION OF CHROMITE FROM ACIDIC PULPS. Filed Nov. 12, 1980 by Dept. of Interior. Patent 4,311,584 issued Jan. 19, 1982. Inventor: *Gregory E. Smith, et al.*

SN 6-186,871. FLAME RETARDING CELLULOSIC MATERIALS WITH SODIUM OR POTASSIUM THIOCYANATE. Filed Sept. 12, 1980. Patent 4,302,345 issued Nov. 24, 1981. Inventor: *Robert J. McCarter.*

SN 6-923,837. DEWATERING OF SLIMES. Filed July 12, 1978 by Dept. of Interior, Patent 4,303,532 issued Dec. 1, 1981. Inventor: *Annie G. Smelley, et al.*

SN 6-300,830. LONG WAVELENGTH ACOUSTIC FLOWMETER. Filed Sept. 10, 1981 by NBS. Inventor: *James Potzick, et al.*

PATENT NOTICES

Certificates of Correction for the Week of May 18, 1982

D. 258,766	4,293,674	4,305,686	4,314,658
4,138,465	4,294,523	4,305,847	4,315,320
4,159,188	4,294,861	4,306,200	4,316,058
4,187,196	4,295,808	4,306,737	4,316,690
4,208,345	4,296,035	4,306,818	4,316,784
4,213,678	4,296,669	4,306,886	4,316,797
4,240,170	4,297,275	4,307,295	4,316,837
4,248,473	4,297,279	4,307,573	4,316,843
4,248,648	4,297,426	4,307,881	4,316,845
4,251,174	4,297,452	4,308,188	4,316,963
4,254,357	4,297,840	4,308,761	4,317,014
4,256,291	4,298,230	4,308,863	4,317,812
4,256,826	4,298,268	4,309,106	4,318,732
4,260,172	4,298,363	4,309,182	4,318,805
4,266,133	4,298,458	4,309,326	4,318,958
4,266,135	4,298,644	4,309,526	4,319,057
4,268,006	4,298,695	4,309,633	4,319,172
4,270,801	4,299,519	4,309,730	4,319,388
4,271,417	4,300,039	4,309,876	4,319,486
4,272,388	4,300,091	4,311,495	4,319,641
4,273,535	4,300,505	4,312,009	4,319,675
4,274,914	4,300,817	4,312,013	4,319,782
4,276,191	4,301,287	4,312,152	4,319,949
4,277,576	4,301,640	4,312,309	4,320,166
4,278,018	4,301,905	4,312,495	4,320,204
4,281,996	4,301,968	4,312,527	4,320,339
4,283,028	4,302,216	4,312,750	4,320,341
4,285,614	4,302,341	4,312,761	4,320,383
4,285,905	4,302,814	4,313,206	4,320,396
4,286,523	4,302,894	4,313,506	4,320,413
4,287,527	4,302,995	4,313,739	4,320,857
4,289,665	4,303,194	4,313,931	4,321,074
4,292,494	4,303,443	4,314,050	4,321,093
4,292,734	4,303,448	4,314,122	4,322,392
4,293,305	4,303,541	4,314,165	4,322,567
4,293,414	4,303,758	4,314,290	
4,293,533	4,304,236	4,314,423	

Erratum

In the Official Gazette Notice of Disclaimers of May 11, 1982 (1018 OG 16), reference to Patent No. 4,191,635 should be corrected to appear as follows:

Disclaimer

4,191,635.—*Leonard M. Quick*, Naperville, Ill., and *Albert L. Hensley, Jr.*, Munster, Ind. PROCESS FOR THE CRACKING OF HEAVY HYDROCARBON STREAMS. Patent dated Mar. 4, 1980. Disclaimer filed Feb. 25, 1982, by the assignee, *Standard Oil Co.*

The term of this patent subsequent to Jan. 1, 1997 has been disclaimed.

Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries

The libraries listed herein, designated as patent depository libraries, receive current issues of U.S. Patents and maintain collections of earlier issued patents. The scope of these collections varies from library to library, ranging from patents of only recent months or years in some libraries to all or most of the patents issued since 1870, or earlier, in other libraries.

These patent collections are open to public use and each of the patent depository libraries, in addition, offers the publications of the patent classification system (e.g. The Manual of Classification, Index to the U.S. Patent Classification, Classification Definitions, etc.) and provides technical staff assistance in their use to aid the public in gaining effective access to information contained in patents. With one exception, as noted in the table following, the collections are organized in patent number sequence.

Depending upon the library, the patents may be available in microfilm, in bound volumes of paper copies, or in some combination of both. Facilities for making paper copies from either microfilm in reader-printers or from the bound volumes in paper-to-paper copies are generally provided for a fee.

Owing to variations in the scope of patent collections among the patent depository libraries and in their hours of service to the public, anyone contemplating use of the patents at a particular library is advised to contact that library, in advance, about its collection and hours, so as to avert possible inconvenience.

State	*Name of Library*	*Telephone Contact*
Alabama	Birmingham Public Library	(205) 254-2555
Arizona	Tempe: Science Library, Arizona State University	(602) 965-7607
California	Los Angeles Public Library	(213) 626-7555 Ext. 273
	Sacramento: California State Library	(916) 322-4572
	Sunnyvale: Patent Information Clearinghouse*	(408) 738-5580
Colorado	Denver Public Library	(303) 573-5152 Ext. 222
Delaware	Newark: University of Delaware	(302) 738-2238
Georgia	Atlanta: Price Gilbert Memorial Library, Georgia Institute of Technology	(404) 894-4519
Illinois	Chicago Public Library	(312) 269-2814
Louisiana	Baton Rouge: Troy H. Middleton Library, Louisiana State University	(504) 388-2570
Massachusetts	Boston Public Library	(617) 536-5400 Ext. 265
Michigan	Detroit Public Library	(313) 833-1450
Minnesota	Minneapolis Public Library & Information Center	(612) 372-6552
Missouri	Kansas City: Linda Hall Library	(816) 363-4600
	St. Louis Public Library	(314) 241-2288 Ext. 214, 215
Nebraska	Lincoln: University of Nebraska-Lincoln, Engineering Library	(402) 472-3411
New Hampshire	Durham: University of New Hampshire Library	(603) 862-1777
New Jersey	Newark Public Library	(201) 733-7814
New York	Albany: New York State Library	(518) 474-5125
	Buffalo and Erie County Public Library	(716) 856-7525 Ext. 267
	New York Public Library (The Research Libraries)	(212) 930-0850
North Carolina	Raleigh: D. H. Hill Library, N.C. State University	(919) 737-3280
Ohio	Cincinnati & Hamilton County, Public Library of	(513) 369-6936
	Cleveland Public Library	(216) 623-2870
	Columbus: Ohio State University Libraries	(614) 422-6286
	Toledo/Lucas County Public Library	(419) 255-7055 Ext. 212
Oklahoma	Stillwater: Oklahoma State University Library	(405) 624-6546
Pennsylvania	Philadelphia: Franklin Institute Library	(215) 448-1321**
	Pittsburgh: Carnegie Library of Pittsburgh	(412) 622-3138
	University Park: Pattee Library, Pennsylvania State University	(814) 865-4861
Rhode Island	Providence Public Library	(401) 521-7722 Ext. 226
South Carolina	Charleston: Medical University of South Carolina	(803) 792-2372
Tennessee	Memphis & Shelby County Public Library and Information Center	(901) 528-2957
Texas	Dallas Public Library	(214) 748-9071
	Houston: The Fondren Library, Rice University	(713) 527-8101 Ext. 2587
Washington	Seattle: Engineering Library, University of Washington	(206) 543-0740
Wisconsin	Madison: Kurt F. Wendt Engineering Library, University of Wisconsin	(608) 262-6845
	Milwaukee Public Library	(414) 278-3043

*Collection organized by subject matter.

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PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF April 3, 1982

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—D. E. TALBERT, Director ..... Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metallurgical Apparatus; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	6-23-80
GENERAL ORGANIC CHEMISTRY, GROUP 120—C. E. VAN HORN, Director ..... Heterocyclic Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	1-04-80
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—J. O. THOMAS, JR., Director .... Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g., Coating; Molding; Ink; Prosthdontics; Adhesive and Abrading Compositions; Molding, Shaping, Treating Process, and Apparatus Therefor; Irradiation (Part); Bleaching; Dyeing; Leather, Fur and Textile Treating Compositions.	3-04-81
COATING, LAMINATING AND PHOTOGRAPHY, GROUP 160—S. N. ZAHARNA, Director ..... Coating: Processes, Apparatus and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; and Photography.	3-16-81
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—R. F. WHITE, Director ..... Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	2-08-81
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—S. W. ENGLE, Director Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Horology; Acoustics; Recorders; Weighing Scales.	8-26-80
SPECIAL LAWS ADMINISTRATION, GROUP 220—KENNETH L. CAGE, Director ..... Ordnance, Firearms and Ammunition; Lubrication; Illumination; Nuclear Reactors; Acoustics, Communications, Optics; Radar; Directional Radio; Torpedoes; Seismic Exploring; Cathode Ray Tube Circuitry; Cryptography; Laser Devices; Radioactive Materials; Powder Metallurgy, Rocket Fuels; Special, Fuel, Explosive and Thermic Compositions; Thermal and Photoelectric Batteries.	8-05-80
INFORMATION TRANSMISSION, STORAGE, AND RETRIEVAL, GROUP 230—EARL LEVY, Director ..... Communications; Multiplexing Techniques; Television; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	5-05-80
RECEPTACLES, CLEANING, WINDING, AND MEASURING, GROUP 240—G. M. FORLENZA, Director ..... Receptacles; Bearings; Joint Packing; Conduits; Switches; Presses; Plumbing Fixtures; Textile Spinning; Cleaning; Food Treating; Agitating; Centrifugal Separating; Geometrical Instruments; Sound Recording; Image Projectors; Web Feeding; Winding and Reeling; Cable Hoists; Measuring and Testing; Indicating; Fluent Material Handling; Shaft; Impellers; Rotary Fluid Motors.	12-07-79
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—S. S. MATTHEWS, Director ..... Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	11-26-79
DESIGN, GROUP 290—KENNETH L. CAGE, Director ..... Industrial Arts; Household, Personal and Fine Arts.	5-15-80
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—B. R. GRAY, Director ..... Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	8-11-80
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—M. M. NEWMAN, Director .... Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion-Bonding, Metal Founding; Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks; Fishing, Etc.; Butchering; and Books and Printed Matter.	10-01-80
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—R. E. AEGERTER, Director ..... Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Plants; Harvesting; Earth Working and Excavating; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Information Dissemination.	5-29-80
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—D. J. STOCKING, Director ..... Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Couplings; Gearing; Fluid Handling and Control; Lubrication.	10-22-79
GENERAL CONSTRUCTIONS, TEXTILES, MINING AND GEARING, GROUP 350—A. L. SMITH, Director ..... Building Structures; Racks; Cabinets; Closures; Supports; Furniture; Fasteners; Locks; Pipe Couplings; Joints; Miscellaneous Hardware; Textiles; Sewing Machines; Apparel; Footwear; Earth Engineering; Earth Drilling; Mining; Wells; Roads; Bridges; Tool Driving; Gearing; Machine Elements; Clutches.	7-17-80

Expiration of patents: The patents within the range of numbers indicated below expire during April 1982, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents ..... Numbers 3,176,314 to 3,181,174, inclusive

Plant Patents ..... Numbers 2,490 to 2,501 inclusive

Reference Collection
Patent Depository Libraries

PATENT EXAMINING CORPS

ERNEST D. HEITKAMP, Acting Commissioner
WILLIAM PEDDINAN, Deputy Assistant Commissioner

DIRECTORY OF PATENT APPLICATIONS AS OF April 3, 1962

	Annual Filing Date of Oldest New Case Awaiting Action

REISSUE PATENTS

GRANTED MAY 18, 1982

ERRATA

For CLASS	See PATENT NO.
072–202	30,933
373–008	30,937

REISSUE PATENTS

GRANTED MAY 18, 1982

ERRATA

REISSUES

MAY 18, 1982

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

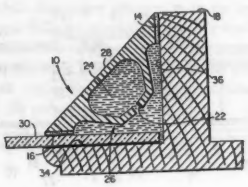
Re. 30,930
GLAZING STRIP AND METHOD

Martin Trachtenburg, 14 Candlewood La., Avon, Conn. 06001, and Robert H. Sand, 20 Trailsend Dr., Canton, Conn. 06019

Original No. 4,138,807, dated Feb. 13, 1979, Ser. No. 891,908, Mar. 30, 1978. Application for reissue Jun. 30, 1980, Ser. No. 164,155

Int. Cl.³ E06B *3/56*

U.S. Cl. 52—309.3 **12 Claims**



9. A glazing strip for application to a corner structure or the like comprising:

(a) an elongated thermoplastic carrier member having longitudinally extending lands oriented at right angles to one another and located adjacent the marginal edges thereof,

(b) pressure sensitive adhesive applied to said lands,

(c) said carrier member defining a longitudinally extending central cavity with inner and outer walls having such thickness that they are flexible,

(d) glazing compound contained in said cavity,

(e) said inner cavity wall defining opening means for said glazing compound,

(f) said inner cavity wall adapted to cooperate with the corner structure to define a space into which some of said glazing compound can be urged by external mechanical pressure applied to said outer cavity wall.

Re. 30,931
WARP KNITTING MACHINE WITH COMPOUND NEEDLES

Karl Winter, Platanenstrasse 6, D6053 Obertshausen, Fed. Rep. of Germany

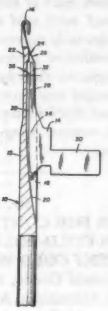
Original No. 4,222,249, dated Sep. 16, 1980, Ser. No. 27,372, Apr. 5, 1979. Application for reissue Apr. 10, 1981, Ser. No. 253,042

Claims priority, application Fed. Rep. of Germany, Apr. 10, 1978, 2815385

Int. Cl.³ D04B *35/04*

U.S. Cl. 66—120 **20 Claims**

18. A shank member for a slider needle, comprising a hook formed end portion and a shank portion, said shank portion having a slot provided therein, the bottom of said slot being provided with a raised portion at the end thereof proximate said hook formed end portion, said raised portion being the only portion to come into contact with a slider member adapted to cooperate therewith.



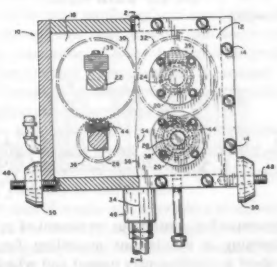
Re. 30,932
VIBRATOR DEVICE

Spencer A. Stone, Fort Wayne, Ind., assignor to The Deister Concentrator Company, Inc., Fort Wayne, Ind.

Original No. 4,080,840, dated Mar. 28, 1978, Ser. No. 741,739, Nov. 15, 1976. Application for reissue Sep. 4, 1979, Ser. No. 72,061

Int. Cl.³ F16H *33/00*

U.S. Cl. 74—61 **4 Claims**



15. A vibrator device, especially for vibrating screen elements, and comprising: a housing, a first pair of parallel shafts in said housing rotatable at a predetermined speed, a second pair of parallel shafts in said housing rotatable at twice said predetermined speed, said first and second pairs of shafts having axes that define spaced parallel planes, means for driving said shafts with the shafts of each pair rotating in opposite directions, said shaft-driving means including gearing drivingly interconnecting said shafts, said gearing including a gear on one end of each shaft, the gears on said first pair of shafts being meshed, the gears on said second pair of shafts being meshed with respective ones of the gears on said first pair of shafts, off-center weights detachably directly mounted on the shafts in engagement therewith and so oriented that rotation of said shafts exert reciprocating forces on said housing in a direction normal to said parallel planes and which pass midway between the axes of the first pair and the axes of the second pair of shafts, said weights being axially positioned on the shafts so that in rotation the centers of gravity lie in a common

plane normal to the axes of the shafts, said weights being radially positioned in rotational alignment such that the rotation thereof define cylinders that are radially juxtaposed, the weights on said first pair of shafts being equal and the weights on said second pair of shafts also being equal but of lesser weight, the weights on said shafts being further oriented thereon to produce an additive effect in said normal direction in one rotated position thereof and a subtractive effect in said normal direction in a position of the weights on one of said pair of shafts which is 180° away from said one rotated position, each of said shafts having a flat side parallel to the axis thereof, each said weight including a flat elongated metal plate contiguously superposed on the flat side of the respective shaft in parallelism therewith, each plate being removably secured to the respective shaft by means of threaded fasteners, said housing being sealed and having opposite sides parallel to said normal plane, and shock mounts carried by said opposite housing sides, said shock mounts being flexible in a direction parallel to said normal plane.

Re. 30,933

APPARATUS FOR CONTINUOUS TREATMENT OF LOW-CARBON COLD-ROLLED STEEL SHEET HAVING EXCELLENT COLD WORKING PROPERTIES

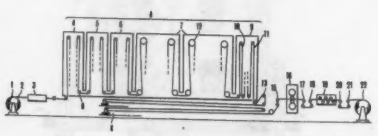
Kenzo Toda; Hisashi Gondo, both of Tokyo; Bunichiro Kawasaki, Hikari; Mitsunobu Abe, Tokyo; Ryoseki Katsutani, Kisarazu; Tsuyoshi Kawano, Kitakyushu; Norimasa Uehara, Kimitsu; Yoshio Saito, Futtsu; Kenichiro Suemune, Kitakyushu; Masahiko Shiraishi, Nakatsu; Yoshifumi Tadashige, Kisarazu; Masao Morimoto, Yokohama; Takao Tsukamura, Funabashi; Kurayoshi Watanabe, Tokyo, and Teruhiko Nishimura, Kisarazu, all of Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Original No. 3,805,571, dated Apr. 23, 1974, Ser. No. 370,756, Jun. 18, 1973. Division of Ser. No. 102,671, Dec. 30, 1970, Pat. No. 3,806,376. Application for reissue Feb. 28, 1980, Ser. No. 125,750

Claims priority, application Japan, Dec. 30, 1969, 44-105435; Feb. 26, 1970, 45-015891; Oct. 9, 1970, 45-088988; Dec. 1, 1970, 45-105457; Dec. 1, 1970, 45-105458; Dec. 1, 1970, 45-106063

Int. Cl.³ B21B *45/02*

U.S. Cl. 72—202 **6 Claims**



1. An apparatus for continuous treatment of cold rolled steel sheet comprising a continuous annealing furnace through which the sheet is continuously passed and which is composed of, in succession, a heating chamber for heating the cold rolled steel sheet to a temperature range of 700° C. to 900° C. within 2 minutes, a soaking chamber for keeping the sheet in the above temperature range for two minutes or less, a primary cooling chamber for rapidly cooling the sheet from the above temperature range to an overageing temperature at a rate of 5° to 30° C./sec., an overageing chamber for keeping the sheet between 300° to 400° C. for up to 8 minutes, *said overageing chamber having a hearth roll therein over which the steel sheet runs for reversing the path of the steel sheet, said roll having a diameter D according to the following formula:*

$$d/R \leqq 2.02\times10^{-3} - 1.05\times10^{-3} \log (t+1)$$

in which d is the thickness in millimeters of the steel sheet, R is the bending radius in millimeters and is equal to one-half D, and t is the time in minutes during which stress is given to the sheet, and a secondary cooling chamber for cooling the sheet from the above overageing temperature to below 50° C. within 2 minutes, and means adjacent the output end of said furnace for successively skin pass rolling, levelling and recoiling the sheet from the annealing furnace.

Re. 30,934

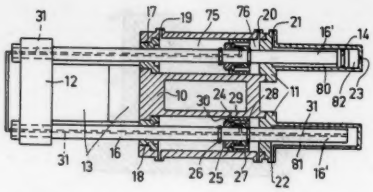
HYDRAULIC DRIVE FOR THE DIE CLOSING UNIT OF AN INJECTION MOLDING MACHINE

Karl Hehl, Arthur-Hehl-Strasse 32, 7291 Lossburg, Fed. Rep. of Germany

Original No. 3,935,791, dated Feb. 3, 1976, Ser. No. 546,036, Jan. 31, 1975. Application for reissue Oct. 19, 1979, Ser. No. 86,320

Int. Cl.³ F15B *11/16*

U.S. Cl. 91—519 **27 Claims**



1. In a hydraulic linear actuator of the cylinder and piston type, whose motion is switchable from a travel mode in which a movable assembly is advanced or retracted at accelerated speed and with comparatively little force to a power mode in which the assembly is subjected to a greatly increased pressure, when the piston is at or near one end of its travel stroke, which actuator is advantageously applicable as a drive for the die closing unit of an injection molding machine, the combination comprising:

a closed power cylinder with hydraulic connections at both extremities for double-acting operation;

a power piston fixedly seated on a piston rod and arranged for longitudinal travel inside said cylinder over the length of a piston stroke; the piston rod having a forward rod portion extending from the forward end of the power cylinder, which rod portion is connected to a movable assembly arranged for travel between an open position on one end of the piston stroke and a closed position on the other end of the stroke, and a rear rod portion extending from the opposite end of the power cylinder; and the power piston further dividing the space of the power cylinder into a high pressure space on that side of the piston which needs to be pressurized to urge the movable assembly into its closed position and a low pressure space on the opposite side of the piston;

a plurality of bypass channels extending generally axially across the body of the power piston from the high pressure side thereof to the low pressure side;

an annular valve seat on the power piston, on its high pressure side, arranged so as to surround the opening of the bypass channels;

a hollow valve plunger sealingly surrounding a cylindrical guide surface on the piston rod on the high pressure side of the power piston, said plunger being guided for axial motion toward and away from the power piston, between a closed position in which a shoulder of the valve plunger sealingly abuts against the valve seat and an open position located a distance away from said seat, and the valve plunger has at least one axial end face exposed to the fluid in the high pressure space;

means for moving the valve plunger between its open and closed positions in response to fluid pressure;

the valve plunger including an area partially defining an expansible valve plunger pressure space which is hydraulically isolated from both the high and low pressure spaces of the power cylinder, the valve plunger moving means including the expansible valve plunger pressure space, the valve plunger

pressure space being connected to a selectively actuable source of hydraulic pressure via a channel in the piston rod, whereby pressurization of the valve plunger pressure space effects expansion thereof to, in turn, effect movement of the valve plunger with respect to the power piston independently both of the movement of the power piston in the power cylinder and also of the pressurization of the high and low pressure spaces of the power cylinder; and

an auxiliary cylinder cooperating with the rear piston rod portion so as to define a coaxial auxiliary linear actuator capable of driving the same movable assembly via the piston rod; and wherein:

the auxiliary cylinder has a much smaller hydraulically effective cross section than the power cylinder, so that, when the auxiliary cylinder is supplied with pressurized fluid while the valve plunger is in its open position, the piston rod and the movable assembly travel at a comparatively high rate of speed, while the power piston moves through the fluid contained inside the power cylinder, as the latter passes through its bypass channels from side to side of the power piston.

Re. 30,935

METHOD OF STARTING GAS PRODUCTION BY INJECTING NITROGEN-GENERATING LIQUID

Edwin A. Richardson, Houston, and Ronald F. Scheuerman, Bellaire, both of Tex., assignors to Shell Oil Company, Houston, Tex.

Original No. 4,178,993, dated Dec. 18, 1979, Ser. No. 902,636, May 4, 1978. Continuation-in-part of Ser. No. 807,946, Jun. 20, 1977, abandoned. Application for reissue Oct. 10, 1980, Ser. No. 195,892

Int. Cl.³ E21B *43/25*

U.S. Cl. 166—300 **16 Claims**

1. A process for treating a gas well from which production is prevented by the hydrostatic pressure of liquid contained within the well, comprising:

injecting into the well at least one aqueous liquid solution which forms or contains a nitrogen gas-forming mixture of (a) at least one water-soluble compound which contains at least one nitrogen atom to which at least one hydrogen atom is attached and is capable of reacting within an aqueous medium to yield nitrogen gas and byproducts which are substantially inert to the components of the well and reservoir formation, (b) at least one oxidizing agent which is capable of reacting with said nitrogen-containing compound to form said gas and byproducts, and (c) an aqueous liquid which is capable of dissolving or homogeneously dispersing said nitrogen-containing compound, the oxidizing agent and the byproducts of the nitrogen-gas-producing reaction;

correlating the composition of the nitrogen-gas-forming mixture with the pressure, temperature and volume properties of the reservoir and well components so that pressure and volume of the gas which is generated displaces sufficient liquid from the well to reduce the hydrostatic pressure to less than the reservoir fluid pressure; and,

initiating gas production from the well by displacing liquid from the well in response to a flow of the pressurized gas formed by the generation of nitrogen gas and allowing gas to flow from the reservoir to the well.

Re. 30,936

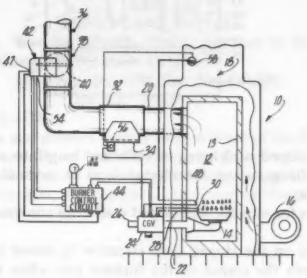
SAFETY CONTROL FOR FURNACE BURNER

Edward R. Kmetz, Grosse Point Park, and George E. Joumas, St. Clair Shore, both of Mich., assignors to Scotty Vent Dampers, Inc., Hazel Park, Mich.

Original No. 4,204,833, dated May 27, 1980, Ser. No. 875,328, Feb. 6, 1978. Application for reissue Nov. 21, 1980, Ser. No. 208,957

Int. Cl.³ F23N *5/24*

U.S. Cl. 431—22 **9 Claims**



9. A safety control arrangement for a combustion heating device of the type having a combustion chamber, a burner disposed therein, fuel feed means controllably supplying fuel to said burner, an exhaust vent means venting said combustion chamber to the atmosphere, and said device including an inlet opening for inducting ambient air, said inlet in fluid communication with said exhaust vent means so as to be subject to outflow of the products of combustion from interruption of flow through said exhaust vent means, said arrangement comprising:

lineal temperature sensor means located to sense outflow of combustion products through said air inlet opening, said means including a sensor tube extending about said inlet opening so as to sense outflow of said combustion products at any point through said inlet opening, said sensor tube including means responsive to being heated to a predetermined elevated temperature corresponding to contact with said outflow of products of combustion at any location along its length to generate a control signal;

control means responsive to said sensing of an abnormal temperature condition by said sensor tube at said inlet opening and generation of said control signal causing said fuel feed means to shut off fuel flow to said burner;

whereby said control means acts to produce shutdown of burner operation in the event of any blockage of said exhaust vent means causing outflow of combustion products through said inlet opening.

Re. 30,937

APPARATUS FOR GAS COLLECTION IN OPEN ELECTRIC SMELTING FURNACES

Harald Krogsrud, Gjettum, Norway, assignor to Elkem-Spigerverket a/s, Oslo, Norway

Original No. 4,005,252, dated Jan. 25, 1977, Ser. No. 614,160, Sep. 17, 1975. Application for reissue Jun. 30, 1980, Ser. No. 164,796

The portion of the term of this patent subsequent to Jul. 15, 1992, has been disclaimed.

Int. Cl.³ F27D *3/00*

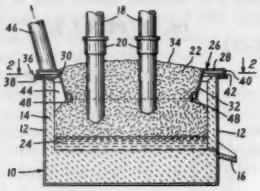
U.S. Cl. 373—8 **4 Claims**

1. In an open electric smelting furnace having a furnace pot for containing a charge, said furnace pot having an annular side wall, the improvement comprising gas collecting apparatus, said gas collecting apparatus comprising:

a. an annular top member spaced from the top of the said annular side wall;

b. sealing means for sealing the space between the said annular member and the top of the said annular side wall, said sealing means comprising a granular material;

c. a sloped wall spaced inwardly from the said annular side wall, said sloped wall being affixed to said annular member;



d. said sloped wall being of sufficient length to extend into the charge when the charge is at its normal operating height;

e. means for moving said sloped wall in an annular direction; and

f. means on the sloped wall effective to move the charge towards the center of the furnace pot when the sloped wall is moved in annular direction.

Re. 30,938

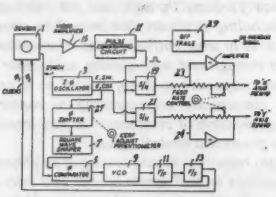
LINE EDGE FOLLOWER

George H. Kallen, Indianapolis, Ind., assignor to Union Carbide Corporation, New York, N.Y.

Original No. 4,049,962, dated Sep. 20, 1977, Ser. No. 709,639, Jul. 29, 1976. Application for reissue Aug. 23, 1979, Ser. No. 69,235

Int. Cl.³ G05B *1/00*

U.S. Cl. 250—202 **3 Claims**



1. A line edge tracer system for use with an X-Y coordinate drive machine to cause said machine to follow the path described by the line edge comprising; a circular photosensor array capable of scanning a field having a radius determined by an optical system associated with said photosensor array; a phase-lock circuit including said photosensor array and a two-phase oscillator circuit for producing sine and cosine wave forms; a phase comparator circuit connected to said two-phase oscillator circuit, the output of said phase comparator circuit being connected to a voltage controlled oscillator circuit, the output of said voltage controlled oscillator circuit producing clock pulses to sequentially sample the individual photosensitive elements in said photo sensitive array to produce a video output signal *represented by a train of video pulses* and to cause said photosensor to emit a sync pulse which is fed back to said phase comparator circuit to synchronize the angular position of said video pulses with the sine and cosine wave forms produced by said two-phase oscillator circuit; [video amplifier circuit connected to said photosensor array; a pulse conditioning circuit connected to said video amplifier for receiving the video signal and for changing the wave form of said signal;] a sample and hold circuit connected to the two-phase oscillator circuit for receiving said sine and cosine wave forms therefrom [and also connected to the pulse conditioning circuit to receive the changed wave form therefrom and also connected to the pulse conditioning circuit to receive the changed wave form therefrom to sample the sine and cosine wave forms by the changed wave forms;] *means responsive to said video output signal for generating a predetermined video pulse for sampling the sine and cosine wave forms;* and an X and Y axis feed rate control circuit connected to such sample and hold circuits for operating an X servo and a Y servo response to the signal received from such sample and hold circuit whereby the resultant of said X and Y movement being the path described by said line.

Re. 30,939

TRANSFER OF A FLEXIBLE WEB MEMBER FROM SUPPLY REEL TO A TAKE-UP REEL

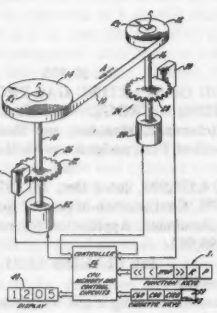
Stephane M. d'Alayer de Costemore d'Arc, and John L. Hiley, both of Brussels, Belgium, assignors to Staar S.A., Brussels, Belgium

Original No. 4,172,231, dated Oct. 23, 1979, Ser. No. 810,276, Jun. 27, 1977. Application for reissue Jan. 31, 1980, Ser. No. 117,371

Claims priority, application France, Jul. 5, 1976, 76 20499; May 31, 1977, 77 16597

Int. Cl.³ B65H *59/38, 77/00;* H02P *5/46, 7/68*

U.S. Cl. 318—7 **31 Claims**



1. A method of monitoring the transfer of a web from reel to reel of a web/reel assembly, in apparatus having means generating signals representing respectively the rotational speeds of the reels, said method comprising the steps of:

storing in memory electrical signals representing constants uniquely characterizing said reel/web assembly and derived from the physical parameters thereof, which constants when used in web position determination algorithms with the ratio of rotational speeds of the reels measured anywhere along the length of the web provides absolute values of web position,

periodically measuring the ratio between the rotational speeds of said reels based on said rotational speed signals from said generating means,

deriving from said memory signals representing the constants for said reel/web assembly,

determining absolute values of successive web positions using said web position position algorithms with said constants and said periodic measurements of reel speed ration, and

monitoring the transfer of the web in said apparatus according to said absolute values of successive web positions.

PLANT PATENTS

GRANTED MAY 18, 1982

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

4,847

ROSE PLANT JP 76-5492

William A. Warriner, Tustin, Calif., assignor to Jackson & Perkins Company, Medford, Oreg.

Filed Sep. 23, 1980, Ser. No. 190,025

Int. Cl.[3] A01H *5/00*

U.S. Cl. Plt.—15 **1 Claim**

1. A new and distinct variety of rose plant of the hybrid tea class, substantially as herein shown and described, characterized particularly as to novelty by the unique combination of its long straight stems, glossy foliage, yellow buds and blooms with a moderate fragrance.

4,848

ROSE PLANT 71-11223

William A. Warriner, Tustin, Calif., assignor to Jackson & Perkins Company, Medford, Oreg.

Filed Sep. 24, 1980, Ser. No. 190,656

Int. Cl.[3] A01H *5/00*

U.S. Cl. Plt.—23 **1 Claim**

1. A new and distinct variety of rose plant of the floribunda class, substantially as herein shown and described, characterized particularly as to novelty by the unique combination of a branched, upright, but compact, plant bearing clusters of near white blooms.

PATENTS

GRANTED MAY 18, 1982

ERRATA

For CLASS	See PATENT NO.
114–345	4,329,751
464–082	4,329,856
220–229	4,329,857
126–293	4,329,967
132–089	4,330,014
420–511	4,330,329
148–430	4,330,330
148–002	4,330,331
149–021	4,330,346
260–544	4,330,366
376–245	4,330,367
376–460	4,330,368
376–268	4,330,369
376–206	4,330,370
376–258	4,330,371
525–054	4,330,441
524–016	4,330,442
527–312	4,330,443
523–404	4,330,444
525–501	4,330,445
523–409	4,330,446
524–269	4,330,447
526–079	4,330,448
524–068	4,330,449
524–458	4,330,451
524–308	4,330,452
524–294	4,330,453
524–773	4,330,454
523–312	4,330,455
524–046	4,330,456
524–602	4,330,457
524–512	4,330,458
523–148	4,330,459
524–849	4,330,460
524–100	4,330,461
524–331	4,330,462
548–546	4,330,471
548–567	4,330,472
549–226	4,330,473
549–367	4,330,474
549–380	4,330,475

PATENTS

GRANTED MAY 18, 1982

ERRATA—Continued

For CLASS	See PATENT NO.
525–012	4,330,638
525–240	4,330,639
372–004	4,330,761
372–085	4,330,762
372–041	4,330,763
362–004	4,330,821
307–100	4,330,855
455–161	4,330,866
455–186	4,330,867
455–327	4,330,868
455–607	4,330,869
455–617	4,330,870

PATENTS

GRANTED MAY 18, 1982

GENERAL AND MECHANICAL

4,329,741

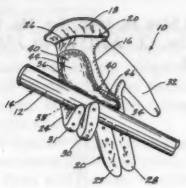
GOLF GLOVE

Merlyn F. Bach, 203 W. Euclid, Des Moines, Iowa 50313

Continuation-in-part of Ser. No. 47,169, Jun. 11, 1979, abandoned. This application Jun. 2, 1980, Ser. No. 155,547

Int. Cl.³ A41D *19/00*

U.S. Cl. 2—161 A **8 Claims**



1. A golf glove comprising a palm portion, a wrist portion adjacent one end of the palm portion and a finger portion on an opposite end of said palm portion comprising,

a first elongated pad secured to said palm portion and extending diagonally thereacross adjacent to and at an angle with respect to said finger portion, and

a second elongated pad secured to said palm portion and extending diagonally thereacross in parallel spaced relation to said first elongated pad,

said first and second elongated pads protruding from said palm portion to create a diagonally disposed valley portion therebetween to receive the handle of a golf club in substantially parallel orientation to said first and second pads.

4,329,742

PROTECTIVE KNITTED BAND FOR USE WITH SAFETY HATS

Walter E. Schuessler, 800 Redbud La., Wilmette, Ill. 60091

Continuation-in-part of Ser. No. 108,518, Dec. 31, 1979, Pat. No. 4,272,853. This application Dec. 22, 1980, Ser. No. 218,915

Int. Cl.³ A42B *3/00, 1/04*

U.S. Cl. 2—424 **19 Claims**

1. A protective band for use with a safety hat having rigid integral crown and brim portions, said band comprising a circumferentially-stretchable tube having open upper and lower ends and being formed of double thicknesses of knitted material; elastic stitching joining the double thicknesses of material at said lower end; said tube when unstretched having a diameter substantially smaller than the diameter of the brim of a safety hat to be worn therewith; said tube having a first transversely-extending brim-receiving slit intermediate the length of the tube, and a second transversely-extending brim-receiving slit diametrically disposed relative to said first slit; and an elasticized border extending around said first slit for engaging the brim and holding the band in place when the brim is extended through said first slit with said band being worn in a raised position; said elasticized border of said first slit also being stretchable for alternatively forming said first slit into a face opening spaced beneath the brim when said band is worn in a lowered position.

4,329,743

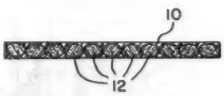
BIO-ABSORBABLE COMPOSITE TISSUE SCAFFOLD

Harold Alexander, Short Hills; John R. Parsons, Perth Amboy; Irving D. Strauchler, Irvington, and Andrew B. Weiss, Short Hills, all of N.J., assignors to College of Medicine and Dentistry of New Jersey, Newark, N.J.

Filed Apr. 27, 1979, Ser. No. 33,945

Int. Cl.³ A61F *1/00*

U.S. Cl. 3—1 **15 Claims**



1. A bio-compatible composition suitable for fabricating a non-migratory surgical article for the repair or replacement of ligament or tendon fibrous tissue of a human or non-human animal comprising a substrate of a plurality of carbon fibers completely enveloped by a bio-absorbable and bio-compatible polylactic acid polymer, wherein the longitudinal axes of said carbon fibers are oriented in substantially the same direction and wherein said fibers provide a scaffold which promotes the growth of new fibrous tissue which is oriented substantially parallel to the longitudinal axes of said carbon fibers.

4,329,744

SHOWER RECEPTOR DRAIN

Casper Cuschera, Casper's Industries, Inc. 1047 77th Ave., Oakland, Calif. 94621

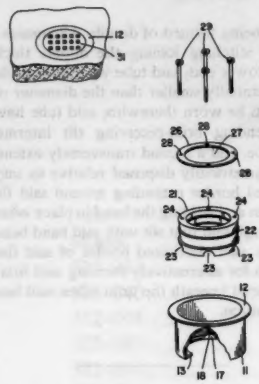
Filed Sep. 26, 1980, Ser. No. 190,916

Int. Cl.³ E03C *1/26*

U.S. Cl. 4—292 **10 Claims**

1. A drain assembly, comprising: a generally cylindrical drain body having a bore extending therethrough, a first flange extending radially inwardly in said bore and defining an opening through which a pipe end portion extends, an annular resilient sealing gasket disposed in said bore adjacent to said flange and received about said pipe end portion, a compression ring disposed in said bore adjacent to said sealing gasket, means for joining said compression ring and said first flange with said

gasket therebetween to effect axial compression of said gasket, and means for aligning said gasket and said drain body in a



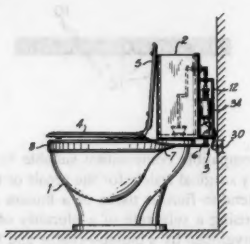
predetermined angular relationship in which said means for joining may be engaged.

4,329,745

AUTOMATIC WEIGHT OPERATED TOILET FLUSHING DEVICE

Lazaro Aguero, 614 SW. 19th Ave., Miami, Fla. 33135

Filed Aug. 20, 1980, Ser. No. 179,766
Int. Cl.³ E03D *5/04;* **H01H** *13/52*
U.S. Cl. 4—313 **3 Claims**



1. An automatic flushing device for toilets having a flush valve operable for releasing water from a flush tank to a toilet bowl provided with a seat hinged upon the bowl for pivotal movement around a horizontal axis at the rearward end of the seat, said device comprising, in operative combination:

(a) an elongated arm secured parallel to the bottom of said seat and extending rearwardly underneath and beyond said flush tank;

(b) a vertical link having one end perpendicularly engaged to the distal end of said arm and capable of reciprocating small pivotal movements of said seat caused by the weight of the user;

(c) a housing secured to said tank through which said link moves;

(d) means for spring biasing said link downwardly with respect to said housing thereby keeping said seat slightly raised from said toilet bowl as the spring bias is transmitted through said arm; and

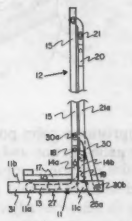
(e) means for actuating said flush valve responsive to the relative positions of said link comprising an electric solenoid mechanically coupled to said flush valve, switch means activated by the relative positions of said link, electric power means connected to said solenoid and interrupted by said switch means, wherein said link further comprises a flexible switch actuator secured to the upper end of said vertical link, wherein said switch means comprises a pair of flexible leaf springs provided with corresponding contacts and one of said springs being slightly longer than the other and provided with a cammed surface.

4,329,746

FOLDING BED-FRAME MEMBER AND BED ASSEMBLY

Wilson L. Bergerud, 30 Herring St., Harrington Park, N.J. 07640

Filed May 16, 1980, Ser. No. 150,635
Int. Cl.³ A47C *17/40, 17/48*
U.S. Cl. 5—164 R **7 Claims**



1. A bed frame member for a wall-type bed which is adapted to be pivotable between a vertical position adjacent a wall and a horizontal position upon a floor, said frame member comprising:

(a) a base which is adapted to rest upon the floor and be moveable with respect to the wall; and

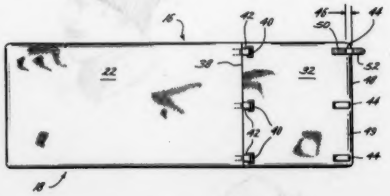
(b) a support section pivotally mounted on the base, means responsive to the rotation of said support section causing movement of the base and support section towards the wall as the support section is pivotally moved for deployment on the floor.

4,329,747

SUPPORT PAD

Chesley G. Russell, 1103 Meadow Rue, The Woodlands, Tex. 77380

Filed May 5, 1980, Ser. No. 146,756
Int. Cl.³ A45F *3/00, 4/06;* **A47G** *9/06*
U.S. Cl. 5—420 **4 Claims**



1. A support pad for a sleeping bag or the like comprising:

(a) mattress pad means for supporting the sleeping bag;

(b) a porous upper cover sheet for covering said mattress pad means;

(c) a lower cover member comprising:

(1) a lower cover slip including a sheet mounted beneath said mattress pad means along a lower portion thereof;

(2) said lower cover slip having an end flap and side flaps extending above said mattress pad means and being connected to said upper cover sheet for enclosing said mattress pad means therebetween;

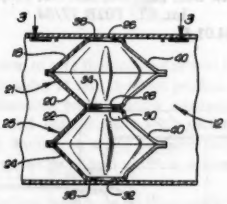
(3) a casing cover slip including a sheet mounted beneath said mattress pad means along an upper portion thereof;
(4) said casing cover slip being formed from heavy duty canvas or like material having an end flap and side flaps extending above said mattress pad means and being connected to said upper cover sheet for enclosing said mattress pad means therebetween;
(5) said lower cover slip and said casing cover slip being connected together along an adjoining surface thereof opposite said end flaps thereof;
(6) said lower cover slip being formed of different material than said casing cover slip;
(d) fastener means for retaining said mattress pad means, said upper cover sheet and said lower cover member in compact, tubular form when rolled, comprising:
(1) a plurality of fastener buckles anchored by fastener tabs and mounted between said casing cover slip and said lower cover slip;
(2) a plurality of fastener straps for engaging said fastener buckles and mounted with said casing cover slip at an opposite end from said fastener buckles;
(3) each of said fastener straps being formed from plural spaced engageable nylon tape closures, one of which is insertable through one of said fastener buckles and engageable with another of said nylon tape closures to retain said mattress pad means, said upper cover sheet and said lower cover member in compact tubular form when rolled.

4,329,748

DOUBLE PANCAKE WATERBED MATTRESS

Alberto L. Finkelstein, Newbury Park, Calif., assignor to Mollura Industries, City of Industry, Calif.

Filed Jul. 3, 1980, Ser. No. 165,710
Int. Cl.³ A47C 27/08
U.S. Cl. 5—451 **5 Claims**



4. A waterbed mattress bag having arrayed throughout substantially its entire operative area, a series of individual baffle assemblies; each of the baffle assemblies comprising a pair of open bladders attached to each other at the center and to the top and bottom mattress layers at the respective ends of the assemblies; said baffle assemblies being movable from a substantially flattened state to an extended state, said baffle bladders being of sufficient size relative to the nominal mattress thickness as substantially to preclude the imposition of stress on the baffle elements due to excessive filling or dynamic loading.

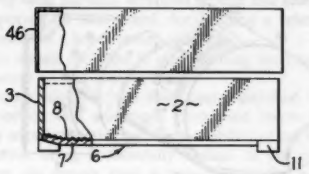
4,329,749

FRAME FOR COMB HONEY

John A. Hogg, 2225 S. 36th St., Galesburg, Mich. 49053

Filed Feb. 13, 1980, Ser. No. 120,951
Int. Cl.³ A01K 47/02, 47/04
U.S. Cl. 6—2 R **11 Claims**

11. A comb section for the production of comb honey comprising:
perimeter means defining the sides of said section and closure means along one edge of said perimeter means defining a bottom;
means on the upper side of said bottom for facilitating the building of honeycomb thereon and within the space defined by said bottom and said perimeter means, said bottom being upwardly beveled along at least a portion of its periphery in order that, upon cooperation with the adjacently positioned section, the bees may be provided



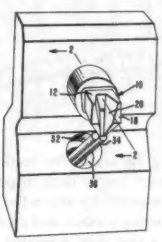
with sufficient space to pass between said beveled bottom and the upper edge of that portion of a lower section immediately adjacent thereto while the unbeveled portion of said bottom will limit the building of comb in said last-named section.

4,329,750

METHOD FOR APPLYING FINISH TO A YARN

Edwin K. Binnersley, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Sep. 15, 1980, Ser. No. 187,172
Int. Cl.³ D06B 1/08
U.S. Cl. 8—151.2 **1 Claim**



1. In a method for applying finish to a continous filament yarn passing through a slot in an applicator wherein finish is supplied to said slot through an orifice in the bottom wall of the slot, the improvement comprising: maintaining yarn contact with the bottom wall of the slot while splaying the filaments as a single layer from about 50 to about 90 percent of the width of said slot at said orifice then confining the filaments to force the formation of additional layers of filaments near the exit of the slot, and leading the filaments tangentially from the exit edge of the bottom wall of the slot.

4,329,751

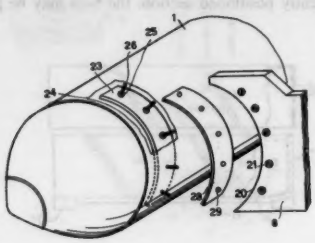
INFLATABLE BOAT

Edoardo Cigognetti, Via della Repubblica, 19, Senago (Milano), Italy

Filed Jul. 1, 1980, Ser. No. 165,021
Claims priority, application Italy, Jul. 25, 1979, 24621 A/79
Int. Cl.³ B63B 7/08
U.S. Cl. 114—345 **6 Claims**

1. An inflatable boat comprising a pair of elongated side portions of flexible material with at least one inflatable air chamber within each side portion, and at the stern of the boat a rigid panel for supporting an outboard motor, and screw-threaded means acting between the flexible material and the panel to hold said side portions at opposite ends of said panel,

said screw-threaded means comprising at least one arcuate strap, means mounting said arcuate strap on said side portion against rotation relative to said side portion, said screw means



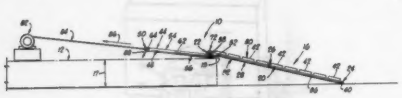
including screws that project radially outwardly through said flexible material from said at least one strap, and means on said panel to receive said screws.

4,329,752

CARGO LOADING APPARATUS

William J. Forrest, 3400 N.W. Expressway, Oklahoma City, Okla. 73112

Filed Nov. 12, 1980, Ser. No. 205,899
Int. Cl.³ E01D 1/00
U.S. Cl. 14—69.5 9 Claims



1. A cargo loading apparatus for loading cargo disposed generally on a first level onto a deck disposed generally on a second level a distance generally above the first level, the deck having a cargo supporting surface and an end, comprising:

a platform having a first side, a second side, a first end, a second end, an upper side, a lower side, and a cargo supporting surface extending generally between the first and the second sides and generally between the first and the second ends of the platform, the cargo to be loaded onto the deck being supportable on the cargo supporting surface of the platform;

a base having a first side, a second side, a first end, a second end, an upper side, and a lower side, the second end of the base being hingedly connected to the first end of the platform, the distance between the first and the second ends of the base being of a sufficient size so that the base and the platform are positionable in an initial loading position wherein the platform is supported generally on the first level and the base extends from the platform generally toward the deck to a position wherein the first end of the base is disposed a distance generally above the second level and the lower side of the base is engageable with the end of the deck; and

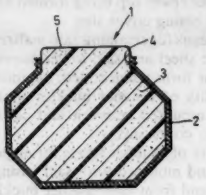
means connectable to the base generally near the first end of the base for pulling the base and the platform connected thereto in a first direction onto the cargo supporting surface of the deck, the base engaging the end of the deck and cooperating to raise the platform connected thereto from the first level to the second level and subsequently onto the cargo supporting surface of the deck as said means pulls the deck and the platform in the first direction.

4,329,753

DEVICE FOR CLEANING SENSITIVE SURFACES OF SOLID BODIES

Peter Weil, Riesstr. 82, Munich, 50, Fed. Rep. of Germany

Filed May 20, 1980, Ser. No. 151,697
Claims priority, application Fed. Rep. of Germany, May 29, 1979, 2921758
Int. Cl.³ C08G 77/04; G11B 3/58
U.S. Cl. 15—104 A 3 Claims



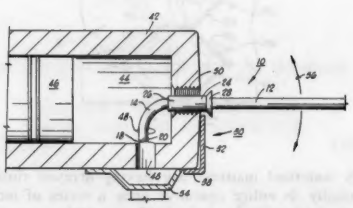
1. A device for cleaning sensitive surfaces of solid bodies, such as phonograph records, optical devices and the like comprising a material consisting essentially of a high molecular weight diorganopolysiloxane containing boroxane groups, said material being in the form of a kneadable substance having the properties of a highly viscous liquid, and container means for holding said material in an operative form having a working surface of said material adapted to be exposed for application to a surface to be cleaned.

4,329,754

CYLINDER MAINTENANCE TOOL

Ray Wilson, 2027 Washington, Chickasha, Okla. 73018

Filed Dec. 15, 1980, Ser. No. 216,445
Int. Cl.³ F02B 77/04
U.S. Cl. 15—104.01 R 12 Claims



1. Apparatus for clearing engine cylinder exhaust ports by access through the spark plug receiver bore, comprising:

a rod implement having an elongated handle portion and a bent tool end portion extending at approximately ninety degrees therefrom; and

template means affixable to the engine cylinder adjacent said plug receiving bore to indicate direction of exhaust ports when said rod implement bent tool end is inserted in said plug receiving bore for clearing operation.

4,329,755

BRUSH

Tacko D. Alissandratos, Box 606, Tarpon Springs, Fla. 33589

Filed Aug. 19, 1980, Ser. No. 179,401
Int. Cl.³ B25G 1/04
U.S. Cl. 15—144 B 5 Claims

1. A brush comprising:

a molded brush head;

said molded brush head including outwardly extending bristles on one surface and a handle holder on the opposite

surface fixed at an angle with respect to the axis of said molded brush head;

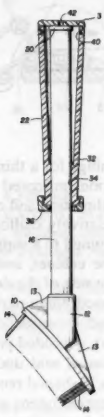
a handle shaft;

said handle shaft including a threaded end and a flanged end;

a handle;

said handle having an inner end and an outer end, said inner end including a threaded portion on its outer circumference and said outer end having a flange thereon on its outer circumference;

a central aperture with said aperture having a uniform diameter portion and a non-uniform diameter portion, said uniform diameter portion extending from said threaded end toward said flanged end, said non-uniform aperture portion extending from said uniform portion and being of a greater diameter than said uniform portion with said non-uniform portion increasing in diameter from said



uniform portion to said flanged end of said handle thereby forming a shoulder at said uniform portion;

said uniform diameter portion being substantially the same diameter as said handle shaft with said flange on said handle shaft having an outer diameter substantially the same as the shoulder at said uniform diameter portion;

a collar;

said collar including threads on its inner surface for engaging said threaded end of said handle and

has an aperture of about the diameter of said handle shaft, said aperture has an axis which is off the axis of said collar to provide an eccentric which binds said collar against said shaft as said collar is threaded onto said threaded end of said handle;

whereby said handle shaft may be secured to said handle holder and said shaft may be secured in said handle in a retracted position and an extended position.

4,329,756

HOT WATER EXTRACTION CARPET AND FLOOR CLEANING MACHINE

Russell G. Chicoine, 4101 W. 59th St., and Salvatore L. Medici, 5919 S. Karlov, both of Chicago, Ill. 60629

Filed Jul. 3, 1980, Ser. No. 165,613

Int. Cl.³ A47L 7/00

U.S. Cl. 15—321 **1 Claim**

1. A hot water extraction carpet and floor cleaning machine, comprising:

a canister-type wet/dry vacuum cleaner including a power cord to be plugged into a source of AC line voltage, an outlet for providing the AC line voltage when the power cord is plugged in, and a relatively rigid wand one end of which is connected, via a suction hose, to a recovery tank in the vacuum cleaner;

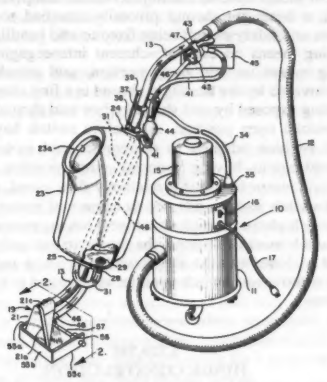
a cleaning head, attached to the other end of said wand and having a pair of wheels to facilitate rolling of the cleaning head, by the operator, over the carpet material or floor material to be cleaned, and further having a suction tool to facilitate extraction of liquid from the material and delivery of that liquid to the recovery tank;

a supply tank, partially wrapped around and attached to and supported on said wand, for holding a relatively large quantity of a hot cleaning solution;

a spray nozzle included in said cleaning head and mounted adjacent to said suction tool;

an electric motor-driven fluid pump attached to and supported on said wand and positioned above said supply tank in order to preclude the possibility of the hot cleaning solution being accidentally spilled on the pump motor when the supply tank is being filled, the pump motor having a power cord adapted to be plugged into said outlet on said vacuum cleaner in order to receive AC line voltage to effect energization of the motor, thereby permitting both the pump motor and the vacuum cleaner to be turned on and off at the same time merely by operating a single switch on the vacuum cleaner;

means, including said fluid pump and a liquid supply line, for



supplying cleaning solution under pressure from said supply tank to said spray nozzle in order that a jet of atomized cleaning solution may be sprayed onto an area of the material to be cleaned, after which the solution and the entrained dirt therein may be drawn off from the material and sucked into said recovery tank as said suction tool is moved across the sprayed area, at least a portion of said suction tool being transparent to provide visual observation of the amount of dirt entrained in the cleaning solution removed from the material and vacuumed into said recovery tank,

the position of said spray nozzle being adjustable relative to said suction tool to vary the area of impact of the jet of atomized cleaning solution on the material to be cleaned;

a retaining wall, included in said cleaning head, which at least partially surrounds the impact area of the jet of atomized cleaning solution to minimize any splashing of that solution onto adjacent areas;

a primer, in the form of a resilient ball, in series with said liquid supply line and which may be squeezed by the operator to prime said pump;

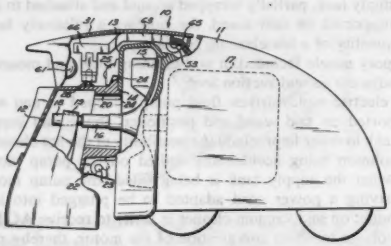
and an adjustably positioned plastic bracket, supported by the end of said wand which is adjacent to said suction hose, for permitting the wand, and the apparatus attached thereto, to lean against a wall or to rest on a floor when the cleaning machine is not in use.

4,329,757

HEADLIGHT CAP WIRING HARNESS AND SWITCH

Lee W. Ramstrom, North Olmsted, and Raymond Strnad, Avon Lake, both of Ohio, assignors to The Scott & Fetzer Company, Lakewood, Ohio

Filed Nov. 21, 1980, Ser. No. 209,132
Int. Cl.³ A47L 9/30
U.S. Cl. 15—324 8 Claims



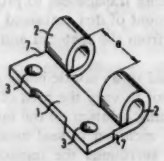
1. In a suction cleaner having a motor, a body portion housing said motor, and interengageable attachments adapted to be attached to the body portion for cleaning operations requiring different motor speeds, the improvement comprising a safety switch, a headlight shroud pivotally attached to said body portion, said safety switch being fixed to said headlight shroud, attaching means on each attachment interengaging with attaching means on said body portion, said attaching means being covered by the headlight shroud in a first closed position and being exposed by said shroud when said shroud is pivoted to a second open position, said safety switch having a first switch position adapted to disconnect said motor from an electrical circuit, having a second switch position adapted to cause said motor to run at a relatively slow speed, and having a third switch position adapted to cause said motor to run at a relatively high speed, each attachment having means to actuate said switch means to permit the motor to run only when the shroud is closed and the attachment is in place and including means to move said switch to either said second or third switch positions.

4,329,758

HINGE CONSTRUCTION

Artur Föhl, Schorndorf, Fed. Rep. of Germany, assignor to Repa Feinstanzwerk GmbH, Alfdorf, Fed. Rep. of Germany

Filed Jan. 17, 1980, Ser. No. 113,055
Claims priority, application Fed. Rep. of Germany, Jan. 17, 1979, 2901691
Int. Cl.³ E05D 5/14
U.S. Cl. 16—273 5 Claims



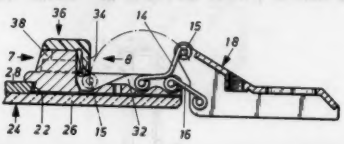
1. Door hinge, comprising two mounting plates each having at least one eye-shaped extension formed thereon, said extensions being alternatingly disposed along a common hinge axis and having inner bearing surfaces and lateral contact surfaces spaced apart from each other, a hinge pin disposed in said extensions on said bearing surfaces for holding said extensions together, and a plastic covering disposed on said extensions and covering said bearing surfaces and said lateral contact surfaces, said mounting plates having openings formed therein, and said extensions having free ends with detent tabs integral therewith, said tabs being secured in said openings.

4,329,759

OVER-CENTER HINGE, ESPECIALLY FOR MIRRORED CABINET DOORS

Reinhard Lautenschläger, Reinheim, Fed. Rep. of Germany, assignor to Karl Lautenschläger KG, Reinheim, Fed. Rep. of Germany

Filed Mar. 24, 1980, Ser. No. 133,247
Claims priority, application Fed. Rep. of Germany, Mar. 30, 1979, 2912813
Int. Cl.³ F05D 11/10
U.S. Cl. 16—335 12 Claims



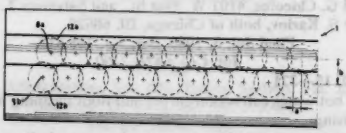
1. An over-center hinge for a thin-walled door of a cabinet, especially of a bathroom mirrored cabinet, said hinge being movable in a closing direction and opening direction and vice versa, and having a relatively shallow, door-related hinge part which is articulately joined to a supporting arm fastenable to a supporting wall of the cabinet, and which is fastenable in a matching recess on the side of the door facing the inside of the cabinet, said door-related hinge part having a holding projection having a T-shaped cross-section and projecting beyond said shallow hinge part, a molded piece removably fastened to said holding projection of said door-related hinge part, said molded piece having a T-shaped recess complementary to said cross-section, which recess opens at least on one side of said molded piece and at its bottom to permit removable mounting on said holding projection, said molded piece having a tongue with a tip extending into said hinge part and which, during the hinge's movement in closing direction, extends into the path of an engaging surface provided on said supporting arm and is displaceable resiliently against a spring force by said engaging surface, and on which tongue said engaging surface slips during a part of the closing movement beyond a dead-center position on one side of which position said tongue exerts on said supporting arm a force in said opening direction and on the other side of which it exerts thereon a force acting in said closing direction.

4,329,760

FOWL DEFEATHERING APPARATUS

Martinus P. G. van Mil, Boxmeer, Netherlands, assignor to Stork PMT BV, Netherlands

Filed Feb. 4, 1980, Ser. No. 118,659
Claims priority, application Netherlands, Feb. 6, 1979, 7900942
Int. Cl.³ A22C 21/02
U.S. Cl. 17—11.1 R 4 Claims



1. A fowl picking apparatus comprising upper and lower opposing parallel rows of rotary picking elements turning in unison, each picking element including a disc body and a plu-

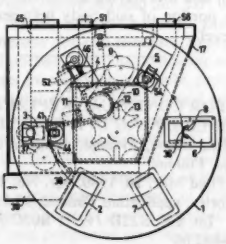
rality of circumferentially spaced picking fingers projecting therefrom in a direction toward the picking elements of the opposing row, the picking elements of the upper and lower rows having their axes of rotation equidistantly spaced along the rows and the axes of rotation of the picking elements in the upper rows being offset from the axes of rotation of the picking elements in the lower rows in a direction along the upper and lower rows and equidistantly with respect to each upper and lower pair of picking elements, and the spacing between the upper and lower rows, between the rotary picking elements in the rows and said offset spacing being such that the circles defined by the tips of the picking fingers during rotation of the picking elements at least touch tangentially along the two rows and along inclined axes through the rotational centers of the offset picking elements of the upper and lower rows.

4,329,761

SQUIDS CLEANING MACHINE

Sven Olsson, Hälsingborg, Sweden, assignor to Societe d'Assistance Technique pour Produits Nestle S.A., Lausanne, Switzerland

Filed Oct. 31, 1980, Ser. No. 202,650
Claims priority, application Sweden, Nov. 15, 1979, 7909425
Int. Cl.³ A22C *29/00*
U.S. Cl. 17—71 9 Claims



1. An apparatus for the mechanical trimming of molluscs, especially squid, characterized in that it comprises

(a) a station for attachment of the squid to holding means for holding it during the trimming;

(b) a station having cutting means for cutting the tentacles of the squid, leaving its head;

(c) a station having a cutter for loosening the viscera of the squid from its mantle wall, and with gripping means for gripping and extracting the head of the squid with its associated viscera from the mantle;

(d) a station having means for removing at least part of the tissue on the inside part of the mantle located above the pen in the squid;

(e) a station having gripping means for gripping and extracting the pen from the mantle, and optionally

(f) a station having a device for removing the trimmed mantle from the holding means and transport of the mantle for further treatment; and

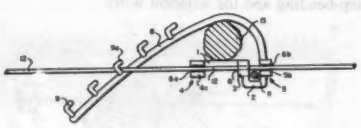
(g) means for transporting the holding means with the squid successively through the stations (a)–(f) and for returning the holding means to the station (a) for receiving a new squid.

4,329,762

CLAMP CONNECTOR FOR VINES

Georg Maidhof, Carlsberg, Fed. Rep. of Germany, assignor to Maidhof GmbH, Carlsberg, Fed. Rep. of Germany

Filed Apr. 25, 1980, Ser. No. 143,647
Claims priority, application Fed. Rep. of Germany, Sep. 6, 1979, 2935987
Int. Cl.³ B65D *63/00*
U.S. Cl. 24—16 PB 22 Claims



1. A clamp connector formed of an elastically deformable but sufficiently plastic material to tie wires, rods or shrubs together, comprising;

a yoke formed from a U-shaped member having a yoke base and two yoke legs adapted for gripping around a rod;

a web having one end connected with said yoke and together with said yoke base lies in a first common plane;

a first seating means including a first end piece connected with said web and forming one outer end piece;

a second seating means including a second piece connected with one leg of said yoke and forming another outer end piece;

a third seating means including an intermediate piece connected with said other leg of said yoke;

each of said pair of leg portion having a free space therebetween;

said outer end pieces opening in a first direction and said intermediate piece opening in a direction opposite to said first direction with the bases of said outer pieces lying in a second common plane parallel to said first common plane and the bases of said intermediate piece lying in a plane parallel to said first common plane with said free space between each said pair of leg portions of said pieces being aligned for gripping therebetween a span wire which extends in a direction transverse to said rod; and,

said plane of the base of said intermediate piece being spaced from said second common plane a distance related to the diameter of the span wire to provide for a gripping effect among all three said bases of said pieces.

4,329,763

PROCESS FOR SOFTENING NONWOVEN FABRICS

Robert E. Alexander, Shelby, N.C., and Kenneth R. Baugh, Pensacola, Fla., assignors to Monsanto Company, St. Louis, Mo.

Filed Jan. 4, 1979, Ser. No. 946
Int. Cl.³ D04H *3/08*
U.S. Cl. 28—104 7 Claims

1. A process for softening a softenable, bonded nonwoven fabric said process being characterized in that said fabric is impinged with a fluid jet having jet characteristics correlated to effect at least a twenty-five percent reduction in bending modulus of said fabric.

4,329,764

STEPPED COMBINATION APPARATUS

Yoshikazu Sakaue, Amagasaki; Tatsuo Mitsunaga, and Toshihiro Kinoshita, both of Kobe, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 962,992, Nov. 22, 1978, Pat. No. 4,304,033. This application Apr. 10, 1981, Ser. No. 252,897
Int. Cl.³ H02K *15/04*
U.S. Cl. 29—33 F 4 Claims

1. A stepped combination apparatus which comprises:

transferring means for moving a bundle of flat rectangular

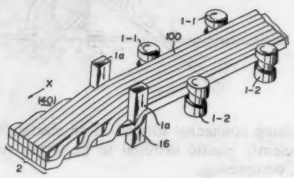
component wires arranged in plural rows and plural lines in the longitudinal direction;

pushing means adapted to contact one side of said bundle for pushing component wires in the line direction so as to offset a component wire at the opposite side;

shifting means for shifting the offset component wire to another row;

stepped-bending means for step-bending the component wire which is offset;

a knife device for separating the component wire treating by step-bending and the adjacent wire;



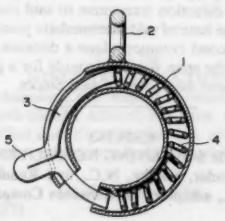
rollers, each having a groove on the peripheral surface, each said groove having a width for fitting a component wire, said groove being formed in a slant direction so as to move the wire for the width of said groove in a predetermined direction as the wire is passed in said groove defined in the surface of said rollers during each turn thereof, each of said rollers having a inlet portion connected to each of said grooves, each of said inlets being parallel to the circumference of the roller.

4,329,765

METHOD FOR MANUFACTURING A SPRING RING TO BE ELECTROPLATED

Shigesaburo Nakagawa, Ichikawa, Japan, assignor to Nakawa Corporation, Tokyo, Japan

Filed Sep. 28, 1979, Ser. No. 79,993
Int. Cl.³ B23P *15/00*
U.S. Cl. 29—160.6 **8 Claims**



2. A method of manufacturing a spring ring which comprises:

brazing a ring onto a tubular link body;

coating a spring with an electrically non-conducting film;

assembling the coated spring together with a movable core member into the tubular link body;

and electroplating the assembly.

4,329,766

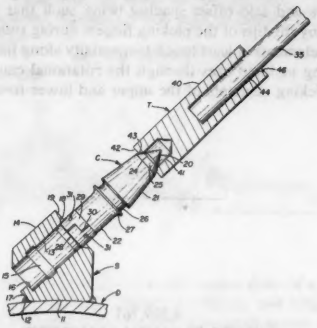
TOOL FOR INSTALLING SCARIFIER TEETH

James F. Leonard, P.O. Box 244, Bennett, Colo. 80102, and John Lane, P.O. Box 502, Strasburg, Colo. 80136

Continuation-in-part of Ser. No. 70,150, Aug. 27, 1979, abandoned. This application Feb. 2, 1981, Ser. No. 230,399
Int. Cl.³ B23P *19/04*
U.S. Cl. 29—254 **10 Claims**

1. A tool for installing a scarifier tooth in a socket attached to a rotatable drum, said socket having a hole inclined to a radius of said drum and a groove receiving an annular spring surrounding a recess in a stem of said tooth, said tooth having a generally conical tip formed of relatively hard metal extending from one end of a body of said tooth, said tooth having weld metal attaching said tip to said body at the position of emergence of said tip from said body and an outer bevel between said weld metal and said stem, said tool comprising:

an elongated member having a hole extending generally centrally into said member from one end, an inner bevel



extending around said hole at said end at an angle of not less than 32½° to the center line of said hole so as to form an interior frusto-conical surface having an included angle of not less than 65° between opposite sides thereof and means at the opposite end of said member for driving attachment to a device for imparting impacts to said tool corresponding to impacts of an air hammer or the like; and

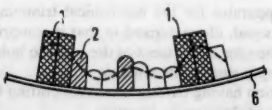
said hole in said tool having a diameter to surround said tip and any portion of said body between said tip and said outer bevel.

4,329,767

METHOD FOR CONTINUAL REPLACEMENT OF THE RUBBER LINING IN A ROTATING MILL

Timo U. Niitti, Espoo, Finland, assignor to Outokumpu Oy, Outokumpu, Finland

Filed Mar. 10, 1980, Ser. No. 128,393
Claims priority, application Finland, Mar. 14, 1979, 790864
Int. Cl.³ B22D *19/10*; B02C *17/14*
U.S. Cl. 29—402.08 **9 Claims**



1. A method of continually replacing the rubber lining of a rotating mill as the lining wears, such lining consisting in its initial state of adjacent zones parallel to the rotational axis of the mill and the height of the zones varying in the peripheral direction of the mill, the method comprising

using rubber beams of equal width and new beams of only one height, which is greater than the height of any other beams in the lining, said other beams being worn in varying degrees

removing, as the lining wears, the worn beams,

sorting the removed beams into a few categories according to their height, the categories having been selected on the basis of the lining profile,

discarding removed beams unfit for even the lowest height group, and

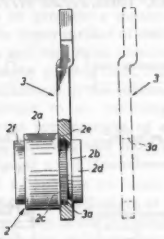
replacing the removed beams with beams of selected category so as to maintain a suitable variation of beam height in the peripheral direction of the mill, thereby using, according to need completely new and replaced sorted, worn beams, respectively.

4,329,768

METHOD OF MANUFACTURING A LOCK FOLLOWER ARM WITH A PRESS-FITTED HUB

Erik R. Tranberg, Eskilstuna, and Bo G. Widen, Torshälla, both of Sweden, assignors to GKN Stenman AB, Eskilstuna, Sweden

Division of Ser. No. 884,444, Mar. 7, 1978, Pat. No. 4,226,454. This application Apr. 1, 1980, Ser. No. 136,213
Claims priority, application Sweden, Mar. 8, 1977, 7702601
Int. Cl.³ B23P *17/00*
U.S. Cl. 29—417 **3 Claims**



1. A method of manufacturing a lock follower from one arm part and one hub part, comprising punching said arm part from a sheet-metal blank, providing a through hole in said arm part for receiving said hub part, providing said hub part with a first, larger outer diameter portion adjacent a second, smaller outer diameter portion to thereby define a shoulder, providing axial ridges on said second portion, the outer diameter of said second portion being larger than said through hole, providing said hub part with a peripheral groove adjacent said second portion, and joining said hub part and said arm part together by pressing said second portion of said hub part into said through hole causing a flow of material from said arm part into said peripheral groove and abutting said shoulder against said arm part; wherein said hub part is machined and cut from a length of tubular or rod material prior to joining it to said arm part, and is provided with said peripheral groove and axial ridges prior to being cut from said tubular or rod material.

4,329,769

APPARATUS FOR WORKING ON TUBESHEETS

Raymond H. Glatthorn, St. Petersburg, Fla., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Dec. 5, 1979, Ser. No. 100,678
Int. Cl.³ B23Q *3/157*
U.S. Cl. 29—568 **8 Claims**

1. Apparatus for remotely working on tubes and holes in a tubesheet of a steam generator head, said apparatus comprising:

a first set of rails affixed to said head so as to be generally parallel to said tubesheet;

a second set of rails disposed between said tubesheet and said first set of rails and generally parallel to said tubesheet;

said second set of rails being slidably disposed on said first set of rails;

a carriage slidably disposed on said second set of rails;

a turret pivotally mounted on said carriage and having a tool holding and driving means detachably mounted on at least one end of said turret;

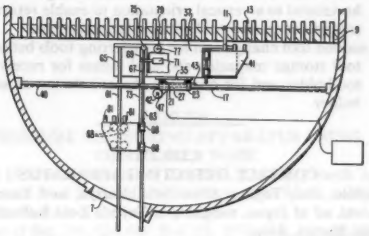
means for moving said carriage longitudinally along said second set of rails;

means for moving said second set of rails longitudinally along said first set of rails;

means for rotating said turret with respect to said carriage;

at least one tool mounted on said tool holding and driving means;

means for rotating said tool and for advancing it into a tube hole being disposed in said tool holding and driving means;



a pair of rods detachably connected to said turret and slidably attached to said tool driving and holding means;

means for releasing said tool driving and holding means from said turret; and

means for moving said tool driving and holding means along said pair of rods to facilitate changing said tool in said tool driving and holding means;

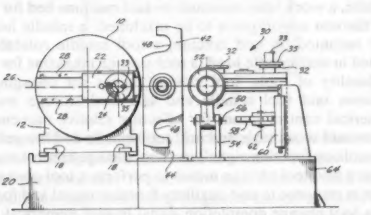
whereby said tool can operate on every tube hole in the tubesheet.

4,329,770

AUTOMATIC TOOL CHANGER

Ervin J. Kielma, West Allis, Wis., assignor to Kearney & Trecker Corporation, West Allis, Wis.

Filed May 1, 1980, Ser. No. 145,853
Int. Cl.³ B23Q *3/155*
U.S. Cl. 29—568 **2 Claims**



1. In combination with a machine tool having a bed, a housing slidably mounted on said bed, a rotary driven toolhead journaled into said housing for rotation about and transverse movement along a first axis, said toolhead having a cross feed facing slide slidably mounted thereon for movement thereacross along a second axis perpendicular to, but lying in the same plane, as said first axis and said cross feed facing slide having a means thereon for receiving and releaseably engaging a toolholder thereto, an automatic tool changer comprising:

a frame stationary with respect to said toolhead;

a tool storage magazine mounted on said frame, said tool storage including a plurality of sockets each adapted to vertically store a toolholder;

a tool change arm rotatably journaled in said frame for rotation about, and axial movement along an axis parallel to said first axis, said tool change arm having a tool gripper at each end thereof positioned so that each tool gripper is operative to transfer a toolholder to said cross feed

facing slide and to transfer a toolholder from said cross feed facing slide;

means for receiving a toolholder and for changing the orientation of said toolholder from a vertical orientation at which said toolholder is parallel to the toolholders stored in said tool storage magazine to a horizontal orientation at which said toolholder is parallel to said toolholder in said cross feed facing slide to enable transfer of said toolholder received by said means to said cross feed facing slide by said tool change arm and for changing the orientation of a toolholder received from said tool change arm from a horizontal to a vertical orientation to enable return of said toolholder to said tool storage magazine; and

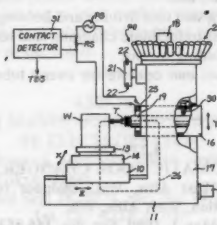
a second tool change arm for transferring tools between said tool storage magazine and said means for receiving said toolholder and for changing the orientation of said toolholder.

4,329,771

CONTACT DETECTING APPARATUS

Kunihiko Eto, Toyota; Shiro Seki, Kariya, and Kaoru Owa, Aichi, all of Japan, assignors to Toyoda Koki Kabushiki Kaisha, Kariya, Japan

Filed Jun. 18, 1980, Ser. No. 160,542
Claims priority, application Japan, Jun. 29, 1979, 54/83328
Int. Cl.³ B23Q 3/155
U.S. Cl. 29—568 **4 Claims**



1. In a machine tool including a machine bed, an upstanding column, a work table mounted on said machine bed for mounting thereon a workpiece to be machined, a spindle head slidably mounted on said column, a tool spindle rotatably supported in said spindle head, a tool storage magazine for storing a plurality of tools, tool change means for changing tools between said tool spindle and said tool storage magazine, numerical control means for effecting relative movement between said work table and said tool spindle and for generating an auxiliary function signal, and tool change control means for causing said tool change means to perform a tool change operation in response to said auxiliary function signal and for applying a tool change completion signal to said numerical control means upon completion of the tool change operation, a contact detecting apparatus comprising:

an AC power source;

a coil mounted on said spindle head and connected to said AC power source for generating an induced current in a first looped secondary circuit including the workpiece, work table, machine bed, column, spindle head, tool spindle and tool in said tool spindle when said workpiece an said tool in said tool spindle are moved relatively into contact with each other, and in a second looped secondary circuit including the tool change means, tool in said tool spindle, tool spindle and spindle head when a tool change operation is performed by said tool change means;

first means connected between said AC power source and said coil for detecting a change in an electric signal caused by the contact between said workpiece and said tool in said tool spindle and the contact between said tool change means and said tool in said tool spindle to output a contact detecting signal; and

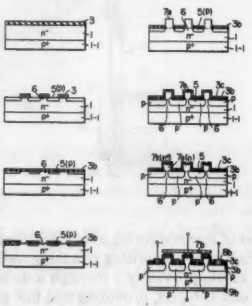
second means for detecting that a contact detecting signal is not generated, even if a tool change operation has been performed.

4,329,772

METHOD FOR MANUFACTURING A SEMICONDUCTOR DEVICE UTILIZING SELECTIVE EPITAXIAL GROWTH AND POST HEAT TREATING

Saburo Oikawa; Susumu Murakami, both of Hitachi, and Yoshio Terasawa, Katsuta, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 27, 1980, Ser. No. 134,673
Claims priority, application Japan, Mar. 30, 1979, 54-37034
Int. Cl.³ H01L 21/20, 21/223, 29/80
U.S. Cl. 29—571 **6 Claims**



1. A method of making a semiconductor device comprising the steps of:

preparing a semiconductor substrate having a main surface and a semiconductor layer therein of one conductivity type adjacent to said main surface;

covering said main surface of said semiconductor substrate with a first mask having an opening which exposes a portion of said semiconductor layer;

doping impurity atoms into said semiconductor layer through said opening of said first mask to make a first semiconductor region of another conductivity type opposite to said one conductivity type in said semiconductor layer;

selectively covering the main surface of said semiconductor substrate with a second mask to cover the entire exposed surface of said first semiconductor region and an adjacent outer portion of the semiconductor layer provided in said main surface and to expose another portion of the semiconductor layer on the main surface whereby the another portion of the semiconductor layer is left uncovered;

depositing a second semiconductor region of said one conductivity type epitaxially on the exposed portion of said semiconductor layer not covered with second mask; and

heating said semiconductor substrate to cause diffusion of said impurity atoms outwardly from said first semiconductor region to enlarge said first semiconductor region into a portion of the semiconductor layer and into a portion of the second semiconductor region, the second mask preventing auto-doping of said impurity atoms from said first semiconductor region into said second semiconductor region during deposition of said second semiconductor region, and the width of the second semiconductor region being controllably reduced.

4,329,773

METHOD OF MAKING LOW LEAKAGE SHALLOW JUNCTION IGFET DEVICES

Henry J. Geipel, Jr., Essex Junction, and Richard B. Shasteen, Colchester, both of Vt., assignors to International Business Machines Corp., Armonk, N.Y.

Filed Dec. 10, 1980, Ser. No. 214,940
Int. Cl.³ H01L 21/22, 21/26
U.S. Cl. 29—571 7 Claims

1. A method of forming integrated circuit IGFET devices having ion implanted and diffused source and drain regions comprising the steps of:

providing on a semiconductor substrate first selected regions of thermally grown oxide to provide dielectric isolation means between said IGFET devices;

forming insulated gate electrodes over at least some second selected regions of said substrate;

ion implanting arsenic ions into remaining regions of said substrate using said dielectric isolation means and said gate electrodes as masking means, said arsenic ions being implanted so as to provide a maximum concentration substantially at the upper surface of said remaining regions of said substrate, said maximum concentration being substantially equal to, or greater than, that of the maximum solid solubility of arsenic in the substrate; and

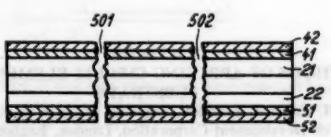
exposing said substrate to an oxidizing/annealing atmosphere between the temperatures of about 900° C. and 1100° C. by, first, exposing said substrate to an oxidizing atmosphere, including a wet oxidation step, for a period of time determined to provide an oxide thickness on said remaining regions of said substrate at least equal that of the projected range, Rp, of the implanted arsenic plus four times the standard deviation, sigma, of said implanted arsenic and, second, exposing said substrate to a non-oxidizing atmosphere for an additional period of time such that the effect of charge produced by said implanted arsenic ions in said dielectric isolation means is minimized.

4,329,774

SILICON RESISTOR HAVING A VERY LOW TEMPERATURE COEFFICIENT

Michel Calligaro, Paris, France, assignor to Thomson-CSF, Paris, France

Filed Jul. 3, 1979, Ser. No. 54,605
Claims priority, application France, Jul. 4, 1978, 78 19932
Int. Cl.³ H01L 21/22
U.S. Cl. 29—583 2 Claims



1. A method of fabrication of a silicon resistor having a very low temperature coefficient and constituted by a semiconductor body doped right through by a first substance which is capable of producing energy levels of the acceptor type at the edge of the forbidden band on the low-energy side and by a second substance which is capable of producing energy levels of the donor type, said donor levels being located in the lower portion of the forbidden band but closer to the center of said band than the energy level of the first substance wherein said method comprises at least the following steps:

(a) starting from a p-type semiconductor body of parallelepipedal shape, atoms of the first substance are diffused from deposits placed on two opposite faces of said body;

(b) the semiconductor body is doped right through from deposits of the second substance on the same faces;

(c) the two faces are metallized in order to form ohmic contacts constituted by successive deposits on each face of a layer of nickel and a layer of gold; and

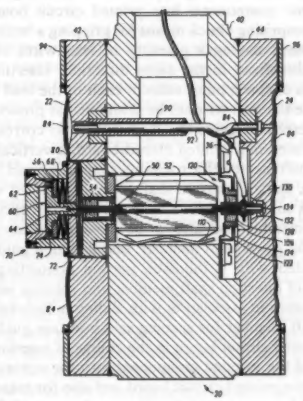
(d) the semiconductor body is cut along the lines of an orthogonal lattice which has been marked out on one of the metallized faces.

4,329,775

PRESSURE MEASURING APPARATUS USING VIBRATABLE WIRE

Everett O. Olsen, Wrentham; James R. LaCroix, North Attleboro, and Hoel L. Bowditch, Foxboro, all of Mass., assignors to The Foxboro Co., Foxboro, Mass.

Division of Ser. No. 834,481, Sep. 19, 1977, Pat. No. 4,165,651.
This application May 3, 1979, Ser. No. 35,734
Int. Cl.³ G01L 11/00, 27/00
U.S. Cl. 29—602 A 2 Claims



1. The method of making a force-responsive instrument of the type including a tensioned wire of round cross-section to be vibrated perpendicular to the wire axis, wherein said instrument includes field-producing magnetic means operable with said wire to induce vibration; said method including the steps of:

positioning said wire in a magnetic field directed perpendicularly to the wire axis;

vibrating said wire by electrical means connected to the wire and arranged to develop interaction with said magnetic field;

developing an electrical signal proportionately responsive to the magnitude of vibrations of said wire;

effecting relative rotation between said wire axis and said magnetic field while maintaining constant the intensity of said magnetic field;

making measurements of the amplitude of the signal developed by said wire;

determining from said measurements the position of said wire relative to said magnetic field providing maximum signal amplitude; and

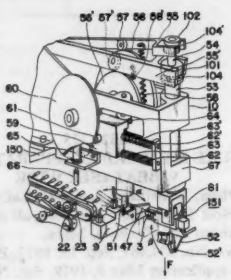
fixing said wire in said instrument in said position relative to said magnetic means.

4,329,776

COMPONENT INSERTING APPARATUS

Kazuhiro Mori; Hiroshi Nakagawa; Yoshihiko Misawa, all of Katano, and Kiyoshi Mayahara, Kadoma, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Feb. 14, 1980, Ser. No. 121,410
Claims priority, application Japan, Feb. 14, 1979, 54-16611
Int. Cl.³ H05K *3/30*
U.S. Cl. 29—741 2 Claims



1. A component inserting apparatus for inserting electrical and electronic components into printed circuit boards, said apparatus comprising chuck means for gripping a body portion of a component having a plurality of lead wires extending outwardly therefrom in the same direction, insertion guide means which contacts outer sides of each of the lead wires so as to regulate the lead wires to be positioned at predetermined positions thereby to guide the lead wires into corresponding openings formed in a printed circuit board, a vertically movable guide shaft member for rotatably supporting said insertion guide means, and an insertion shaft member coupled with said chuck means so as to be movable in the same direction as said guide shaft member and also to be movable relatively with respect to said guide shaft member, said insertion guide means being provided with a follower portion contacting a cam formed in said insertion shaft member and rotating said insertion guide means in association with sliding movement of said insertion shaft member for spacing said insertion guide means from the printed circuit board in the course of insertion of the lead wires of the gripped component into the corresponding openings in the printed circuit board and also for rotating said insertion guide means in a direction to be spaced from the component.

4,329,777

WIRE WRAPPING TOOL

Charles R. Murphy, 333 Cobalt, Sunnyvale, Calif. 94086

Division of Ser. No. 883,436, Mar. 6, 1978, Pat. No. 4,169,310.
This application Jun. 8, 1979, Ser. No. 46,986
The portion of the term of this patent subsequent to Oct. 2, 1996, has been disclaimed.
Int. Cl.³ H01R *5/00;* B21F *3/04*
U.S. Cl. 29—751 14 Claims

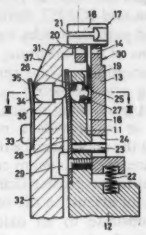
1. In a wire wrapping tool: a sleeve having a side provided with an opening therethrough, a bit rotatably received in the sleeve and having an axially extending, outer peripheral groove alignable with the opening in the sleeve, said sleeve having a continuous cutting edge defining the boundary of said opening, at least a portion of the cutting edge being curved, said curved portion extending longitudinally of the sleeve and outwardly of the opening.

4,329,778

APPARATUS FOR RETAINING A SLIDER

Hisashi Doori, Kurobe, Japan, assignor to Yoshida Kogyo K.K., Toyama, Japan

Filed Sep. 4, 1980, Ser. No. 184,027
Claims priority, application Japan, Sep. 7, 1979, 54-124217
Int. Cl.³ B23P *19/04*
U.S. Cl. 29—768 4 Claims



1. An apparatus for retaining a slider having a body and an apertured pull tab pivotally connected to the body in a position for application to a pair of slide fastener stringers, said apparatus comprising:

(a) an arm;

(b) a slide slidably mounted on said arm and having a seat for supporting the slider body thereon, there being a slot defined between said arm and said slide for receiving therein the slider pull tab as extending transversely of the slider body;

(c) first means in said arm for resiliently engaging the slider pull tab inserted in said slot to allow the slider body to rest on said slider seat;

(d) a block; and

(e) second means in said block for resiliently coacting with said first means to lock the slider pull tab in said slot, said arm and said block being relatively movable into and out of a position in which said first and second means can coact with each other.

4,329,779

METHODS OF APPLYING CIRCUIT ELEMENTS TO A SUBSTRATE

Eric H. England, Swindon, England, assignor to National Research Development Corporation, London, England

Filed Feb. 20, 1980, Ser. No. 123,773
Claims priority, application United Kingdom, Feb. 26, 1979, 7906701
Int. Cl.³ H05K *3/34*
U.S. Cl. 29—840 18 Claims

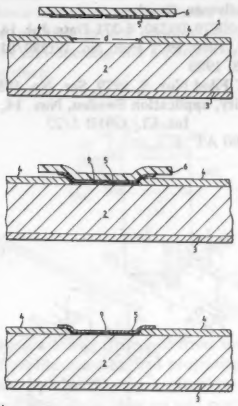
1. A method of incorporating a distributed microwave circuit element in a microwave integrated circuit comprising:

providing the circuit element defining a face on a given surface of a first, carrier substrate, formed by a high-definition thin-film technique;

providing a second substrate on which said integrated circuit is to be formed, said second substrate carrying a conductive planar microcircuit pattern formed by a low-definition technique and having a gap in the pattern for incorporation of said element;

placing said given surface of the carrier substrate in contact with the surface of the second substrate adjacent said gap;

attaching the circuit element to the surface of the second substrate; and



providing an electrical connection between said element and the conductive pattern.

4,329,780

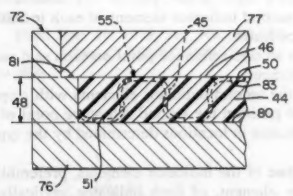
METHOD OF MAKING A REINFORCED WEAR-RESISTANT LINER

M. John Somers, Dayton, Ohio, assignor to Dayco Corporation, Dayton, Ohio

Division of Ser. No. 946,672, Sep. 28, 1978, Pat. No. 4,237,792. This application Jun. 30, 1980, Ser. No. 164,667

Int. Cl.³ H01K *3/22*

U.S. Cl. 29—848 **12 Claims**



1. In a method of making a reinforced wear-resistant liner for use between a center plate of a body bolster and a center plate of a truck bolster of a railway vehicle comprising the steps of; molding a polymeric material to define said liner having a top planar surface adapted to engage said body center plate and a bottom planar surface adapted to engage in truck center plate; and embedding a liner reinforcement in said polymeric material during said molding step, the improvement comprising constructing said liner reinforcement to serve the additional purpose of electrically conductive means and define dual-purpose means, said dual-purpose means being embedded during said embedding step with a top surface portion thereof comprising said top surface and a bottom surface portion thereof comprising said bottom surface, said top and bottom surface portions each comprising a small fractional part of its associated planar surface and said top and bottom portions being defined by integral continuous apexes in said liner reinforcement, said dual-purpose means providing reinforcement for said liner and a comparatively low electrical resistance path through said liner with each surface portion in contact with an associated center plate.

4,329,781

SHAVING APPARATUS HAVING A SHEAR PLATE WITH HAIR-ENTRY APERTURES AND A CUTTING UNIT WITH LEAD CUTTERS, WHICH UNIT IS DRIVABLE RELATIVE TO THE SHEAR PLATE

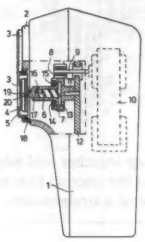
Hugo Schemmann, Schaesberg, Netherlands, and Gerhard Diefenbach, Aachen, Fed. Rep. of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 29, 1979, Ser. No. 98,434

Claims priority, application Fed. Rep. of Germany, Dec. 7, 1978, 2852990

Int. Cl.³ B26B *19/16*

U.S. Cl. 30—34.2 **4 Claims**



1. A shaving apparatus having a shear plate provided with hair-entry apertures and a cutting unit associated with and drivable relative to the shear plate; said cutting unit comprising a cutting member, cutters extending from said cutting member toward the shear plate, each cutter having a guide wall and an end wall, lead cutters respectively associated with and movable relative to the cutters away from and toward the shear plate, each lead cutter, with reference to the direction of driving the cutting unit, being positioned in front of its associated cutter and slidingly engaging the guide wall of such associated cutter, each lead cutter having a front wall and an end wall normally in contact with the shear plate, each lead cutter front wall being essentially perpendicular to its associated cutter end wall, and a projection extending forwardly from each lead cutter front wall adjacent the end wall of such lead cutter and terminating in a cutting edge for penetration into a hair, the thickness of such projection being such that only partial penetration into the hair is effected, the perpendicular front wall of the lead cutter further limiting penetration of such projection into the hair.

4,329,782

GAUGE FOR CHECKING SIZES OF MECHANICAL PARTS

Mario Possati; Guido Golinelli, both of Bologna, and Narciso Selleri, Monteveglio, all of Italy, assignors to Finike Italiana Marposs, S.p.A., S. Marino di Bentivoglio, Italy

Filed Jul. 22, 1980, Ser. No. 171,161

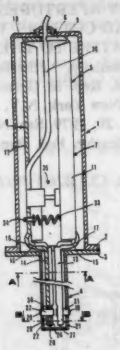
Claims priority, application Italy, Jul. 24, 1979, 3465 A/79

Int. Cl.³ G01B *7/12*

U.S. Cl. 33—147 K **5 Claims**

1. A gauge for checking linear sizes of mechanical parts, comprising a support, a fulcrum device coupled to the support, a movable measuring arm coupled to the fulcrum device, a feeler, an adjustment and locking device for adjusting and locking the feeler with respect to the measuring arm, the adjusting and locking device including a stem or pin housed within a transversal hole of the measuring arm and a screw adapted to cooperate with the stem, and detecting means for detecting the position of the measuring arm, wherein the measuring arm includes a portion having substantially the shape of a straight tube, a connecting portion, for connecting said portion having substantially the shape of a straight tube with said fulcrum device, the connecting portion defining a member with a surface having a concave side, a convex side and two

edges, the portion having substantially the shape of a straight tube being obtained by longitudinally bending an end section



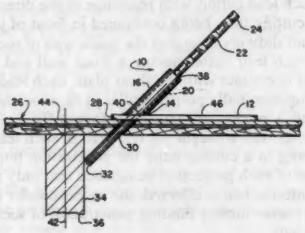
of said member to bring together said edges, said screw being axially arranged within the internal hole of said portion having substantially the shape of a straight tube.

4,329,783

RAFTER FINDER

Joseph A. Maresca, Greenlawn, N.Y., assignor to Grumman Allied Industries, Inc., Melville, N.Y.

Filed Jan. 31, 1980, Ser. No. 117,065
Int. Cl.³ G01B 3/28
U.S. Cl. 33—169 R **2 Claims**



1. A hand tool for use from the outside of a roof or wall to locate an inaccessible structural member such as a rafter therein comprising in combination:

a substantially flat base plate having fixedly mounted thereon at a fixed predetermined angle thereto an upstanding integral tubular guide element, the bore thereof extending the length of said guide element and through said base plate whereby said guide element can be used as a drilling guide for a drill bit to drill a hole at the angle of said guide element through said roof, and whereby the upper edge of said guide element is normal to said bore such that said upper edge serves as an index; and

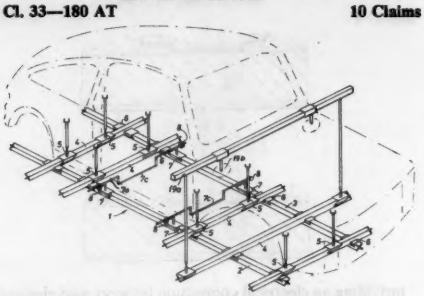
a measuring rod that can be inserted into said bore of said guide element and through said angled hole drilled in said roof until the tip of said rod encounters a rafter, said rod having indicia thereon related to said predetermined guide element angle, the measurement indicated by said index with reference to said indicia on said rod when its tip is in contact with said rafter indicating the distance from the centerline of said drilled hole to the centerline of said rafter, whereby, after removal of said base plate and rod, said rafter centerline can be located precisely from the outside of said roof by use of said measurement that had been indicated by said index and said indicia on said rod.

4,329,784

METHOD AND DEVICE FOR CHECKING THE DIMENSIONS OF VEHICLES

Bengt A. Björk, Eskilstuna, Sweden, assignor to Nicator Aktiebolag, Eskilstuna, Sweden

PCT No. PCT/SE79/00230, § 371 Date Jul. 14, 1980, § 102(e) Date Jul. 11, 1980, PCT Pub. No. WO80/01001, PCT Pub. Date May 15, 1980
PCT Filed Nov. 9, 1979, Ser. No. 198,948
Claims priority, application Sweden, Nov. 14, 1978, 7811757
Int. Cl.³ G01B 5/25
U.S. Cl. 33—180 AT **10 Claims**



1. A method of checking the dimensions of vehicles, preferably in connection with carrying out alignment work thereon, using indicators being placed at selected check points on the vehicle, said method comprising the steps of:

suspending a reference frame from the chassis of the vehicle,

suspending a first, elongated indicator element of each indicator like a lead from selected check points on the vehicle so as to be universally movable with respect to the vehicle,

selecting a first reference point on said first indicator element,

placing a second indicator element of each indicator on the reference frame,

selecting a second reference point on each said second indicator element,

adjusting the second indicator elements with respect to the frame to position the second reference point of each second indicator in locations determined by the type of vehicle,

adjusting one of the indicator elements, preferably the first indicator element, of each indicator vertically so as to individually position a respective one of the reference points of each indicator in a vertical position determined by the type of vehicle, and

measuring the distance between the reference points of each indicator, said distance constituting the deviation in position of the respective check point from the desired value.

4,329,785

PRESETTER GAUGE

Anders A. Peterson, Elmira, N.Y., assignor to Hardinge Brothers, Inc., Elmira, N.Y.

Division of Ser. No. 25,717, Mar. 30, 1979, Pat. No. 4,255,056. This application Aug. 5, 1980, Ser. No. 175,666
Int. Cl.³ B27G 23/00
U.S. Cl. 33—185 R **6 Claims**

1. A multiple purpose cutter alignment gauge for an optical presetter comprising:

(a) a body having top, bottom, side, front and rear surfaces;

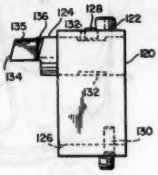
(b) mounting means extending from said top surface through said bottom surface for mounting said gauge on a presetter;

(c) a notch on said bottom surface extending from said front

to said rear surface and transverse to said front and said rear surfaces;

(d) said alignment gauge having an opening therein extending from said front surface to said rear surface and mounted above said notch and extending parallel thereto;

(e) a multiple position profile member having a portion mountable in said opening and a portion projecting from said front surface;



(f) said portion projecting from said front surface having a plurality of profile edges on said projecting portion;

(g) said profile member having a plurality of positioning means spaced from each other on said portion mountable in said opening for repositioning said cutter at different angles to said bottom surfaces to expose a different profile edge for a different alignment purpose, and

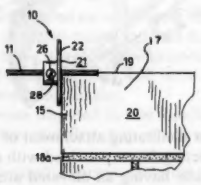
(h) means on said body for locking said profile member against movement with respect to said body.

4,329,786

BRICKLAYER'S PLUMB GUIDE

James V. Martinez, 177 W. 250 North, (Apt. #1), Clearfield, Utah 84015

Filed Dec. 10, 1979, Ser. No. 101,710
Int. Cl.³ G01C *15/10*
U.S. Cl. 33—409 **4 Claims**



1. A bricklayer's plumbing apparatus comprising:

a bricklayer's gage line;

line block means for holding the gage line in tensioned horizontal position; and

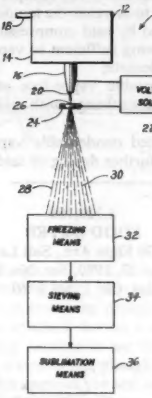
a plumb guide comprising a guide body having a planar end portion disposed normal to said gage line, a longitudinal bore extending normal to said end portion and through the center thereof, and adapted to accept the bricklayer's gage line, means for attaching and removing the guide body to the gage line in a direction normal to said line, and means to lock said body in a desired position along said line, wherein in use the end face of a brick to be layed is brought into contact with said planar end portion while the top of said brick touches said line to provide a guide for vertical construction of a brick wall.

4,329,787

DROPLET EXPLODING AND FREEZING APPARATUS AND METHOD

William A. Newton, P.O. Box 161633, Miami, Fla. 33116

Continuation-in-part of Ser. No. 109,666, Jan. 4, 1980, abandoned. This application Apr. 28, 1981, Ser. No. 258,391
Int. Cl.³ F26B *3/34, 5/06, 13/30*
U.S. Cl. 34—1 **6 Claims**



4. A method of preserving microorganisms including forming an aqueous solution of suspended microorganisms, forming droplets of the aqueous solution, the improvement comprising:

applying an electrical force to the droplets of a strength great enough to break a droplet into a plurality of smaller droplets;

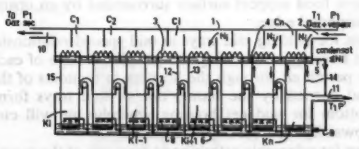
freezing the smaller droplets.

4,329,788

PROCESS FOR SEPARATING A GAS AND A CONDENSABLE VAPOR

Jacques Sterlini, Paris, France, assignor to CEM Compagnie Electro-Mecanique, Paris, France

Filed Jan. 16, 1980, Ser. No. 112,601
Claims priority, application France, Jul. 7, 1978, 78 20363
Int. Cl.³ F26B *3/04*
U.S. Cl. 34—27 **10 Claims**



1. A process for drying an article to be dried comprising:

contacting said article in a drying zone with a gas which is at a temperature sufficiently high to dry said article and form a mixture of said gas and a condensable vapor;

removing said condensable vapor from said gas by passing said mixture through a series of separation zones of decreasing temperature to cool said mixture sufficiently to cause said condensable vapor to condense from said mixture, the gaseous mixture being cooled by heat exchange with a heat exchange fluid in each zone which absorbs the heat of vaporization of said condensable vapor, causing said vapor to condense and the heat exchange fluid to increase in temperature;

recovering the condensable vapor-free gas upon passage through said series of separation zones;

recovering the condensate of said condensable vapor from each zone which has been removed from the gaseous mixture;

passing said condensate of said condensable vapor which has been recovered through a series of vaporization zones whereby said condensate passes in heat exchange relationship with said heat exchange fluid and is heated thereby, a gaseous stream comprising said vaporized condensate passing between said vaporization zones countercurrent to said condensate and being compressed as it passes between said zones to increase the temperature thereof, with the heat provided by said compression and by said heat exchange fluid being sufficient to vaporize at least a portion of said condensate;

heating the condensable vapor-free gas which has been recovered by heat exchange with said vaporized condensate; and

returning said heated condensable vapor-free gas to said drying zone for further drying of said article.

4,329,789

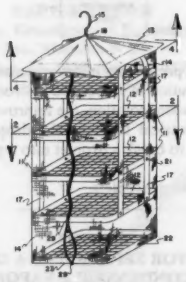
FOOD DRYER

Keith D. Erickson, 1170 Elgin Ave., Salt Lake City, Utah 84106

Filed May 23, 1980, Ser. No. 152,740

Int. Cl.³ F26B *9/10*

U.S. Cl. 34—195 **5 Claims**



1. A food dryer comprising

a collapsible frame including

a hook

a plurality of spaced apart flexible support straps fixed to and adapted to be suspended from said hook;

a collar carried by the hook;

a plurality of spaced apart, tiered trays, each having a perforated food support surface surrounded by an upstanding peripheral edge;

means for holding said trays in said spaced relationship;

a net housing surrounding the peripheral edge of each tray to permit air through the housing to contents of the tray and carried by the frame, one of said trays forming a bottom for said net housing whereby air will circulate upwardly through the tiered trays;

means for releasably attaching at least one of the trays to the support straps;

a heat absorbing roof of flexible sheet material carried by the collar and straps and extending over the tier of trays; and

means for opening and closing said net housing to provide access to and removal of each of said trays.

4,329,790

BOOT WITH ANGULARLY EXTENDING CLEATS

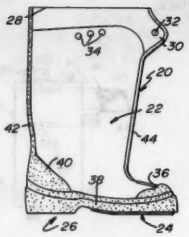
Michael Bell, P.O. Box 400, Warrington, Pa. 18976

Filed Mar. 27, 1980, Ser. No. 134,405

Int. Cl.³ A43B *13/04, 1/10, 23/28*

U.S. Cl. 36—32 R **16 Claims**

11. For use in footwear a sole for providing good traction on soft adhering surface materials and for effecting release of such adhering materials during walking, said sole being molded of resilient material including plural elongated cleats extending across at least a portion of said sole, each of said cleats comprising a pair of raised ridges and a first groove therebetween, the space between immediately adjacent cleats forming a relatively wide second groove therebetween, said second groove



being substantially smooth between immediately adjacent cleats, said cleats being disposed at a predetermined angle to the longitudinal axis of said sole, said angle being approximately equal to the angle made with said axis by a line extending from the second to the fifth metatarsal head of the wearer's foot.

4,329,791

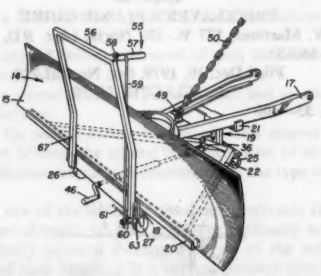
PLOW CADDY

Jerry P. Honkanen, 2907 Lake Forest Rd., Tahoe City, Calif. 95730

Filed May 27, 1980, Ser. No. 153,587

Int. Cl.³ E02F *3/76*; B66F *3/46*

U.S. Cl. 37—42 R **2 Claims**



1. Apparatus for facilitating attachment of a plow, having a blade and a connecting frame provided with a rear connecting portion, to a vehicle having an elevated attachment portion, said apparatus comprising:

a wheeled support having a front portion and a rear portion;

a positioning handle at said wheeled support front portion for positioning the wheeled support to dispose the carried plow frame connecting portion adjacent the vehicle attachment portion;

locking means for selectively locking said wheeled support against rolling movement including a manipulating handle movably mounted to said positioning handle;

carrying means on said wheeled support front portion for removably carrying a plow blade; and

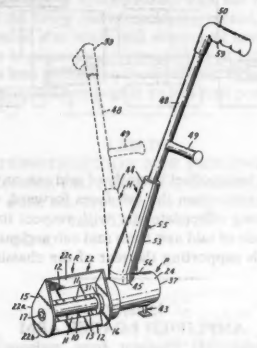
adjustable means on said support under said rear portion for adjustably elevating the rear connecting portion of the plow frame to align said connecting portion with the vehicle attachment portion to provide for facilitated interconnection thereof.

4,329,792

SNOW REMOVER

John M. Berner, Minneapolis, Minn., assignor to David H. Garven, Bloomington, Minn., a part interest

Filed Feb. 25, 1980, Ser. No. 123,934
Int. Cl.³ E01H 5/00
U.S. Cl. 37—43 D 12 Claims



1. A powered snow thrower comprising forwardly open housing means,

snow gathering means rotatable about a horizontal axis perpendicular to the direction of travel,

said gathering means being adapted to throw the gathered snow rearwardly,

wall means forming a part of said housing means and adapted to receive said rearwardly thrown snow and direct same upwardly and forwardly over and beyond said gathering means,

an electric motor supported by said housing means and drivingly engaged with said gathering means for rotating same,

elongate handle means extending upwardly and rearwardly from said housing means, the longitudinal axis thereof being disposed perpendicular to said axis and parallel to the normal direction of travel of said snow thrower,

first grip means at the upper end portion of said handle means,

second grip means carried by said handle means and located between said first grip means and said housing means,

said grip means being adapted to be gripped by the hands of the operator for manipulating said snow thrower,

said handle means being tubular,

electric cord means disposed in said handle means and extending between said first grip means and said electric motor,

switch means located adjacent said first grip means and adapted to be operated by the fingers of the operator and which holds said first grip means,

and plug means cooperatively attached to said cord and switch means for connecting same to a source of electric power, and

wherein said housing means includes a pair of end walls disposed parallel to the direction of travel and an upper housing portion extending between said end walls,

said upper housing portion including a motor enclosing portion disposed between said end walls and upwardly and rearwardly from said wall means,

said handle means extending upwardly and rearwardly from said upper housing portion, and

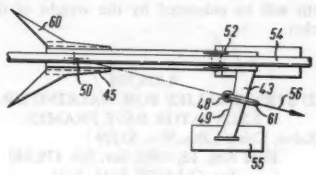
wherein said handle means includes single continuous elongate tubular handle means whose longitudinal axis is perpendicular to the axis of rotation of said gathering means, and tapered housing means extending between said upper housing portion and the lower end portion of said tubular handle means.

4,329,793

SOIL MOVING DEVICE

Alan R. Reece, Fawdon, England, assignor to The British Petroleum Company Limited, London, England

Filed Nov. 1, 1979, Ser. No. 90,124
Int. Cl.³ F16L 1/04; E02F 5/18
U.S. Cl. 37—98 4 Claims



1. A trenching plough which is suitable for underwater towing to form a trench for a previously laid underwater pipeline or cable which trenching plough comprises:

(a) a body having attached thereto a soil cutting member, which soil cutting member in use forms a soil surface in the direction of travel of the plough,

(b) a landside which engages the soil surface,

(c) a steering apparatus which comprises means for engaging the previously laid cable or pipeline, said steering apparatus being spaced apart from, and forward, with respect to the landside,

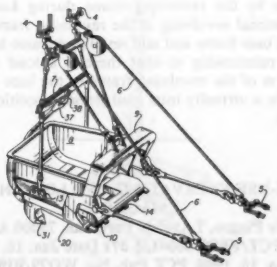
(d) a towing member pivotally connected to a hitch point on the plough whereby the direction of travel of the plough is within limits independent of the direction of the towing vehicle, the hitch point being located so that in use the line of the towing force passes through a point above the landside so that when the direction of travel of the plough is inclined to the line of the towing force, the sideways component of the towing force is resisted by the landside and the sideways forces on the pipeline or cable reduced.

4,329,794

RIPPING ATTACHMENT FOR DRAGLINE

James B. Rogers, Lakeland, Fla., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Mar. 24, 1980, Ser. No. 132,725
Int. Cl.³ E02F 3/76
U.S. Cl. 37—115 5 Claims



1. A detachable earth ripping attachment for use with a conventional dragline bucket said bucket having an underside, a leading edge, a rear wall and drag ropes attached to said bucket, comprising:

a base adapted to fit against and extend along the underside of the bucket, the base having at one end an upwardly

folded lip adapted to fit freely over the leading edge of the bucket, and having at its other end disengageable means passing around the rear wall of the bucket and connectable to the hoist ropes for holding the attachment in place against the bucket; and

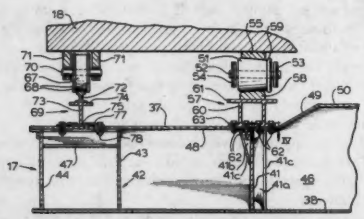
a ripper tooth connected to but spaced below the base within the perimeter of the bucket bottom and having its cutting edge pointing in the same direction as the leading edge of the bucket, such that as the drag ropes pull the bucket across an unbroken earth surface the attachment is drug along by the leading edge of the bucket and the ripper tooth will cut into the surface and the penetration of the tooth will be enhanced by the weight of the dragline bucket.

4,329,795

LOAD STRESS RELIEF FOR WALKING DRAGLINE EXCAVATOR BASE FRAMES

Ernest Kalve, Camp Lake, Wis. 53109

Filed Aug. 18, 1980, Ser. No. 178,940
Int. Cl.³ E02F *3/48, 3/32*
U.S. Cl. 37—116 **31 Claims**



1. In a walking dragline excavator having a massive hollow internally reinforced base frame rotatably supporting a counterweighted revolving frame carrying boom means by which a dragline bucket is adapted to be operated through control means activated from said revolving frame:

built-in annular rail girder means in said base frame concentric with and spaced substantially from an axis about which the revolving frame is adapted to rotate;

annular track means carried by said base frame concentrically over said rail girder means for running thereon of roller means adapted for supporting the revolving frame on said annular track means;

means replaceably connecting said track means to said base frame and permitting load stress relief circumferentially directed relative movement of said track means and said base frame under load transmitted through the roller means by the revolving frame during load lifting and operational revolving of the revolving frame;

and said base frame and said revolving frame having a structural relationship so that there is a load stress sharing relation of the revolving frame to the base frame in contrast to a virtually total load stress imposition on the base frame.

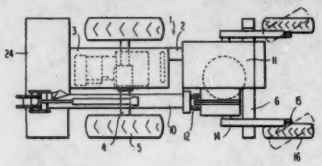
4,329,796

MULTI-USE EXCAVATING AND LOAD HANDLING MACHINE

Pierre J. de Pingon, 7 Ave. du Parmelan, 74000 Annecy, France

PCT No. PCT/FR79/00041, § 371 Date Jan. 16, 1980, § 102(e) Date Jan. 16, 1980, PCT Pub. No. WO79/01075, PCT Pub. Date Dec. 13, 1979
PCT Filed May 8, 1979, Ser. No. 185,916
Int. Cl.³ E02F *3/76*
U.S. Cl. 37—117.5 **8 Claims**

1. a multi-use excavating and load handling machine comprising a chassis, a power unit carried by a forward portion of the chassis and offset laterally with respect to the longitudinal axis of the chassis, driving wheels driven by said power unit and supporting the forward end of the chassis, a slewing gear ring carried by a rear portion of the chassis, a rotatable turret supported by the gear ring for rotation about a vertical axis, a cab carried by the turret, a working attachment carried by the



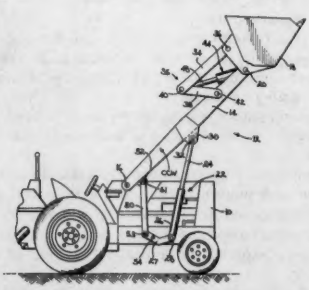
turret, the cab being offset laterally of said axis on the same side as said power unit when the cab faces forward, said working attachment being offset laterally with respect to said axis on the opposite side of said axis from said cab and power unit, and steering wheels supporting the rear of the chassis.

4,329,797

AMPLIFIED LOADER ARM

John F. Shumaker, Mt. Pleasant, Iowa, assignor to J. I. Case Company, Racine, Wis.

Filed Jan. 26, 1981, Ser. No. 228,325
Int. Cl.³ E02F *3/00*
U.S. Cl. 37—118 R **6 Claims**



1. A linkage for operating an implement arm which is pivoted at its lower end to the frame of a material handling machine and which carries an implement at its upper end, comprising:

(a) a downwardly disposed first link pivotally connected at its upper end to said implement arm adjacent the lower end of said implement arm;

(b) extensible hydraulic motor means, pivotally connected at its upper end to said implement arm at a position intermediate the ends of said implement arm and linked at its lower end to said frame for raising and lowering said implement arm, said hydraulic motor means defining a moment arm which is measured from the pivotal connection of said implement arm on said frame perpendicularly to the longitudinal axis of said motor means; and

(c) lever arm means, pivotally connected to said frame at a position intermediate its ends and pivotally connected at one of its ends to the lower end of said first link and at its other end to the lower end of said motor means, for rotating the lower end of said motor means away from the lower end of said implement arm as the implement arm is raised, the other end of said lever arm means being generally disposed towards said implement arm and parallel to said first link, actuating said motor means from its retracted condition has the effect of:

(1) raising the upper end of said implement arm,
(2) raising the lower end of said first link,
(3) raising said one end of said lever arm means, and
(4) rotating the other end of the lever arm means forwardly which shifts the lower end of the motor means forwardly and at a greater distance from the pivotal connection of the implement arm to the frame,

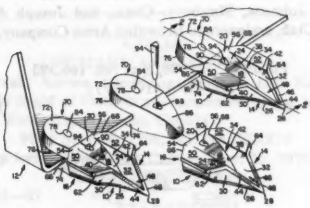
whereby the upward rotation of said implement arm to its raised position is synchronized with the forward movement of the lower end of said motor means, and the resulting moment arm when said implement arm is in its raised position is generally greater than or at least equal to the moment arm defined by the hydraulic motor means when said implement arm was in its lowered position.

4,329,798

TOOTH CONSTRUCTION FOR DIGGING BUCKETS

Gerald D. Edwards, Rte. 1, Box 15A, Dubberly, La. 71024

Filed Jul. 29, 1980, Ser. No. 173,253
Int. Cl.³ E02F *9/28*
U.S. Cl. 37—142 R **9 Claims**



1. A digger tooth for a power digging bucket or the like including an operating portion and an attachment portion, said operating portion comprising in combination:

a back wall having an upper end, a lower end, and an upper surface extending forwardly and downwardly from said upper end to said lower end;

a lower edge extending forwardly from said lower end of said back wall to a leading end;

first and second sidewalls extending upwardly and diverging from said lower edge to define an open cavity, said first and second sidewalls each having a rear edge integral with said back wall and a forward edge, said forward edges together defining a front end opening; and

a wing-like flange extending laterally outwardly from each of said sidewalls from the respective upper edges thereof, each of said wing-like flange also merging at a trailing end thereof with said upper end of said back wall and extending forwardly to merge with the forward edge of the respective sidewall.

4,329,799

TYPING COPY STAND

Bruce K. Nagley, 4765 Kingshill Dr., Columbus, Ohio 43229

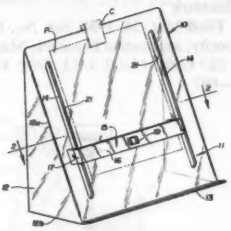
Filed Feb. 14, 1980, Ser. No. 121,637
Int. Cl.³ B41J *11/64*
U.S. Cl. 40—352 **8 Claims**

1. A typing copy stand comprising

a copy support plate having a front copy support surface on which a copy sheet is adapted to be retained in coplanar relationship, a rear surface and a pair of spaced parallel, elongated edge surfaces formed therewith in vertically extending relationship and spaced apart a distance to permit positioning of a sheet of paper therebetween,

a support base for holding said copy support plate in upstanding relationship to a horizontal supporting surface, and

a copy guide line bar including an elongated line guide positioned in overlying relationship to the front surface of said copy support plate and of a length substantially equal to the spacing of said edge surfaces, said line guide being formed from a flat strip of resiliently flexible material capable of flexing only in a direction perpendicular to the plane of said copy support plate and having affixed thereto at each respective end thereof an end flange which projects laterally with respect thereto and extends across respective ones of said edge surfaces terminating a distance rearwardly of the rear surface of said copy support plate and being longitudinally displaceable along said



edge surfaces, and resilient force applying means interconnected with portions of said end flanges projecting rearwardly of the rear surface of said copy support plate for biasing of said flanges toward each other and effecting frictional gripping engagement with said edge surfaces whereby biasing forces exerted on said flanges by said resilient force applying means causes flexing of said line guide outwardly with respect to said front copy support surface and are counterbalanced by resilient forces developed by the flexing of said line guide.

4,329,800

ADJUSTABLE DISPLAY DEVICE

Bernard E. Shuman, Merrick, N.Y., assignor to Eastern Electrical Equipment Co., Inc., Hicksville, N.Y.

Filed Dec. 2, 1980, Ser. No. 212,205
Int. Cl.³ G09F *15/00*
U.S. Cl. 40—606 **7 Claims**

1. A vertically adjustable display device comprising:

a base,

a hollow tube having means at the bottom thereof for mounting to said base,

a rod having a portion disposed within said tube,

said tube having a plurality of threads formed on its interior,

and said rod being formed with a pair of resilient arms at the bottom end thereof, said arms each having a plurality of teeth on the outer surface thereof for engagement with the threads on the interior of said tube for supporting and adjusting the height of said rod relative to said tube, and a display frame attached to this top of said rod.

4,329,801

TIMETABLE HOLDER TO BE PLACED ON A POST AT A BUS OR STREET CAR STOP

Poul J. Clausen, Dyrehavehus, No. 344 Vordingborgvej, 4690 Haslev, Denmark

Filed Mar. 24, 1980, Ser. No. 132,845
Claims priority, application Denmark, Mar. 28, 1979, 1265/79
Int. Cl.³ G09F *15/00, 3/18, 7/02*; F16M *13/00*
U.S. Cl. 40—607 **7 Claims**

1. A timetable holder to be placed on a post at a bus or street car stop and comprising: a tubular timetable supporting element journalled around the post, the tubular element including at least one tube made at least partially of transparent material for the housing of said timetable and one lower tube support sleeve, first means for securing said support sleeve to said post, one upper tube closing sleeve surrounding said post, means for securing said upper sleeve to said post, and means on said lower sleeve and said upper sleeve for journally guiding said transparent tube in relation to said sleeves to permit rotation of said transparent tube about said post; said lower sleeve including a first ring accommodating said first securing means and a second ring placed on said first ring and freely rotatable in relation to said first ring, said second ring being a shape with an annular groove for receiving the lower edge of said transparent tube; and said two rings of said lower sleeve presenting on their sides facing one another open condensation water and rain drops draining passages.

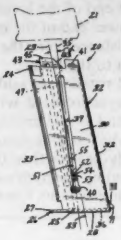
4,329,802

MAGAZINE FOR LARGE-CALIBER HANDGUNS

Daniel J. Coonan, St. Paul, Minn., assignor to Coonan Arms, Inc., St. Paul, Minn.

Filed Sep. 10, 1980, Ser. No. 183,089
Int. Cl.³ F41C *25/02*
U.S. Cl. 42—50 **20 Claims**

1. A magazine for cartridges for a handgun, comprising:
- a casing extending along a longitudinal axis between first and second ends, said casing having first and second broader sides and first and second narrower sides;
- follower means for supporting a column of cartridges, said column having a top cartridge properly aligned for use in said handgun;
- means for biasing said follower means substantially along the longitudinal axis toward said second end of said casing;
- means, when said magazine is fully loaded, for bearing at least one and less than all of said cartridges away from one of said first and second narrower sides; and



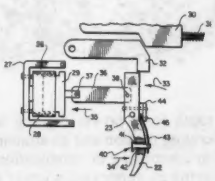
means for longitudinally holding said column of cartridges between said first and second ends.

4,329,803

ELECTRONIC SET TRIGGER

Myron L. Johnson, Simsbury, Conn., and Joseph A. Badali, Ogden, Utah, assignors to Browning Arms Company, Morgan, Utah

Filed Jul. 7, 1980, Ser. No. 166,593
Int. Cl.³ F41C *19/12*
U.S. Cl. 42—84 **10 Claims**



1. In a firearm which has firing mechanism including a sear operable to hold the firing mechanism in cocked condition and to release said firing mechanism in response to operation of a trigger lever, an electronic set trigger, comprising:
- an electro-mechanical device, including:
  - a solenoid coil connected in circuit with a capacitor and an electronic trigger circuit, and
  - a reciprocating core, mechanically linked to said trigger lever to operate it to release said firing mechanism in response to current flow from said capacitor through said coil;
- power supply means connected in a charging circuit with said capacitor to charge said capacitor without energizing said coil; and
- a trigger switch associated with said trigger circuit means for discharging said capacitor through said coil when placed in conductive condition.

4,329,804

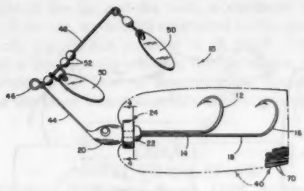
LURE WITH INTERLOCKING ATTACHMENT

Robert L. Brown, 2003 N. 48th Ave., Omaha, Nebr. 68104

Filed Sep. 24, 1979, Ser. No. 78,191
Int. Cl.³ A01K *85/00*
U.S. Cl. 43—42.09 **7 Claims**

1. A lure comprising at least one fish hook having an elongated shank extending forwardly from an arcuate portion, forward and rearward spaced retainers of larger size as measured transversely of said shank than said shank, a strip of flexible material having first protrusions on one side and second protrusions on its opposite side, said first and second protrusions are specifically tiny hooks and material in which said hooks can catch when said hooks are pressed into engage-

ment with said material, said strip being wrapped around said shank between said retainers, said strip being sufficiently long as to extend around said shank enough for outer portions of said strip to overlap inner portions of said strip so as to cause sufficient interlocking of said first and second protrusions as to



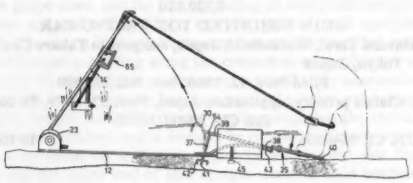
hold said strip on said shank, said retainers retaining said strip from excessive movement along said shank while said strip and protrusions are in said wrapped and interlocked positions respectively, a visible lure element useful in assisting the catching of fish attached to said strip and secured to said hook by said strip.

4,329,805

HUMANE ANIMAL TRAP

Milan Novak, Aurora, Canada, assignor to Her Majesty the Queen in Right of Ontario as represented by the Minister of Natural Resources, Toronto, Canada

Filed May 28, 1980, Ser. No. 153,873
Claims priority, application Canada, Nov. 13, 1979, 339748
Int. Cl.³ A01M *23/34*
U.S. Cl. 43—87 **11 Claims**



1. An animal trap specific to a given range of animal weights, the trap comprising:

a frame,

a spring-arm pivotally mounted at one end to the frame and having means at the other end for entraining a cable, the spring-arm being mounted for swinging movement in a substantially vertical plane between a first position in which it is substantially horizontal and a second position in which it extends upwardly,

spring means biasing the spring-arm toward said second position,

a trip lever adapted to move between an upper, set position in which the lever is adapted to cause the spring-arm to be retained in said first position against the urging of the spring means, and a lower, sprung position in which the spring-arm is released,

a cable having anchoring means at one end and defining at the other end a loop adapted to be placed so as to surround said trip lever,

means for avoiding the springing of the trap by an animal lighter than said given range of animal weights, comprising a spring urging the trip lever toward said upper, set position,

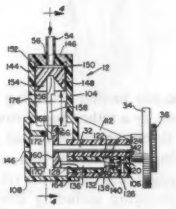
means for avoiding retention in the trap of an animal heavier than said given range of animal weights, comprising a connector in said cable and joining one portion of the cable to another portion thereof, the connector being capable of releasing said portions from connection together upon the application of a sufficient force.

4,329,806

FLUID ENGINE

Kenzo Akiyama, and Ryoji Tomiyama, both of Tokyo, Japan, assignors to Tomy Kogyo Co., Inc., Tokyo, Japan

Filed Nov. 19, 1979, Ser. No. 95,785
Claims priority, application Japan, Nov. 21, 1979, 53-143945; Jun. 28, 1979, 54-82398; Jun. 28, 1978, 54-82399
Int. Cl.³ A63H *29/16, 11/10*; F01L *15/00*
U.S. Cl. 46—44 **17 Claims**



1. A fluid engine comprising:

a housing having a fluid input cavity, a fluid delivery cavity adjacent said fluid input cavity and separated therefrom by a wall having a valve opening therein, and an open-ended exhaust cavity adjacent said fluid delivery cavity and being separated therefrom by a wall having an exhaust opening therein, said valve opening being substantially coaxial with said exhaust opening;

an elongated valve element movably disposed in said exhaust cavity, said valve element having a first portion with smaller cross-sectional dimensions than the cross-sectional dimensions of said exhaust opening and a second portion with cross-sectional dimensions substantially conforming to the cross-sectional dimensions of said exhaust opening, the first and second portions of said valve element being substantially immovable with respect to one another;

a drive shaft rotatably mounted on said housing;

an elongated hollow member mounted on said housing;

a piston member movably mounted within said hollow member to define a piston cavity, said piston member being movable between a first position wherein said piston cavity has minimum volume and a second position wherein said piston cavity has maximum volume;

fluid input port means for allowing continuous fluid communication between a fluid source and said fluid input cavity;

fluid delivery means for allowing continuous fluid communication between said fluid delivery cavity and said piston cavity;

valve means for controlling fluid flow between said fluid input cavity and said fluid delivery cavity through said valve opening; and

means operationally connecting said piston member to said drive shaft and said elongated valve element for moving said elongated valve element toward said fluid input cavity to close said exhaust opening and open said valve means allowing fluid communication through said valve opening to said piston cavity when said piston member moves toward its second position, said means additionally moving said elongated valve element away from said fluid input cavity to open said exhaust opening and close said valve means allowing fluid communication from said piston cavity through said exhaust opening and discontinuing fluid communication through said valve opening when said piston member moves towards its first position.

4,329,807

AERODYNAMIC TOY AND METHOD

Kevin Atkinson, 14515 Oakmont, Dallas, Tex. 75234

Filed Mar. 17, 1980, Ser. No. 131,404
Int. Cl.[3] A63H *27/14, 27/00;* A63B *71/00*
U.S. Cl. 46—81 16 Claims

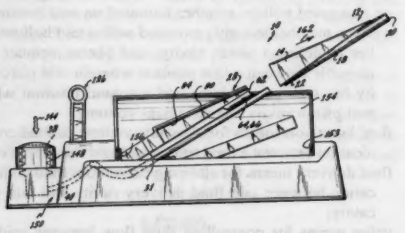
1. An aerodynamic toy having a leading and trailing edge and adapted to be spun by a tether and thrown into the air for flight by a person's throwing motion, said toy comprising a cylindrical ring having a relatively thin wall between said leading and trailing edges and means for retaining said tether upon said ring for throwing including irregularities formed along at least one edge of said ring to permit the thrower to impart an axial spin to said ring as it is released from the tether by the thrower's hand with a forward motion in a direction orthogonal to the plane of the ring and wherein gyroscopic stability is afforded to said ring facilitating its spinning flight through the air.

4,329,808

PAPER-AIRPLANE-MAKING AND LAUNCHING DEVICE

Hubert A. Rich, Westminster; Gary M. Saffer, Torrance, and John C. Woolington, Harbor City, all of Calif., assignors to Mattel, Inc., Hawthorne, Calif.

Filed Jan. 22, 1981, Ser. No. 227,570
Int. Cl.[3] A63H *27/14*
U.S. Cl. 46—81 8 Claims



1. A device for making paper airplanes of the type including a wing, a tubular fuselage, and means for connecting said wing and said fuselage together, said device comprising:

means for holding said fuselage, said holding means comprising a tubular member;

means for supporting said wing adjacent said holding means with said connecting means in juxtaposition with said fuselage;

means for pressing said fuselage against said connecting means and for folding said wing into an aerodynamic configuration;

an air pump; and

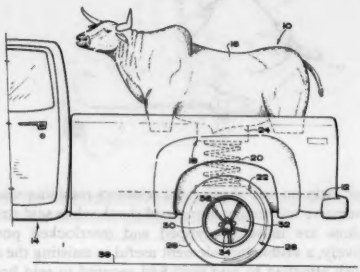
means connecting said air pump to said tubular member for launching said airplane.

4,329,809

BUCKING AMUSEMENT APPARATUS

Vernon N. Reece, Box 167, Dierks, Ark. 71833

Filed Nov. 18, 1980, Ser. No. 208,020
Int. Cl.[3] A63H *11/10;* A63D *1/00*
U.S. Cl. 46—101 7 Claims



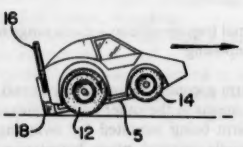
1. A multi-purpose amusement apparatus comprising structure means simulating the appearance of an animal disposed in the bed of a pick-up truck, yieldable mounting means contained in the bed for securing the structure means within the bed of the pick-up truck, and eccentrically mounted rear wheels provided for the vehicle to impart an up and down motion for the bed of the pick-up truck upon rotation of the wheels whereby the yieldable mounted means produces an erratic action for the structure means.

4,329,810

COIN WEIGHTED TOY RACING CAR

Masumi Terui, Matsudoshi, Japan, assignor to Takara Co., Ltd., Tokyo, Japan

Filed Nov. 12, 1980, Ser. No. 205,990
Claims priority, application Japan, Nov. 27, 1979, 54-164128
Int. Cl.[3] A63H *17/00*
U.S. Cl. 46—206 10 Claims



1. A combination toy car and monetary coin comprising:

a monetary coin;

a housing member having a configuration which simulates a vehicle;

a front wheel assembly attached to the housing member;

a rear wheel assembly including an axle and a pair of wheels attached to the housing member;

a support member attached to the housing member on the side of the rear wheel assembly furtherest from the front wheel assembly, the support member configured to provide an exterior slotted compartment extending parallel to the rear axle, the width of the slot being approximately that of the monetary coin to provide a removable frictional connection, the monetary coin removably mounted in the slotted opening and extending upward adjacent the rear surface of the housing member for visible display, the support member is positioned on the housing member a predetermined distance from the rear axle so that the center of gravity of the car without a coin is forward of

the rear axle and with a coin is approximately above the rear axle, and

a guide member configured to contact and slide on a support surface when the front wheel assembly is lifted off the support surface, the guide member is positioned to support the vehicle when rotated about the rear axle so that the weight of the car and the coin, as displaced by acceleration of the car, is partially supported by the guide member, and the equilibrium position of all force vectors is rearward of the rear axle whereby the toy car can be propelled forward to provide an impression of speed which has lifted the front wheel assembly off the ground.

4,329,811

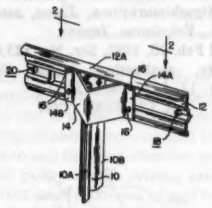
METAL GRAPE STAKE

Don J. Coulson, Huntington Beach, Calif., assignor to North Star Company, Inc., Gardena, Calif.

Filed Oct. 31, 1980, Ser. No. 202,782

Int. Cl.³ A01G *17/06*

U.S. Cl. 47—46 **5 Claims**



1. A grape stake, and the like, including an elongated upright member adapted to be driven into the ground, said upright member having a V-shaped cross-section and having first and second flanges extending along the respective edges thereof; a cross-arm having at least one transverse slot therein intermediate its ends, said cross-arm having a vertical portion extending along its length, and a horizontal portion engaging the top of the upright member; and a bracket having a V-shaped cross-section mounted on said cross-arm adjacent to said slot for receiving the upper end of said upright member, said bracket having at height slightly less than the width of said top of said upright member for holding the upright member firmly against the surface of said cross-arm with the first flange being received in said slot and with the second flange being received at the apex of said V-shaped bracket.

4,329,812

HORTICULTURAL DEVICES

Richard S. Carlisle, P.O. Box 307, Rye, N.Y. 10580

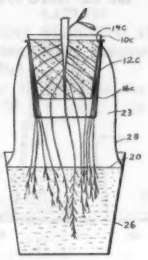
Continuation of Ser. No. 836,978, Sep. 28, 1977, Pat. No. 4,179,846. This application Dec. 19, 1979, Ser. No. 105,103

The portion of the term of this patent subsequent to Dec. 25, 1996, has been disclaimed.

Int. Cl.³ A01G *31/00*

U.S. Cl. 47—59 **10 Claims**

1. A horticultural device useful in seed germination and growth of plants, including a container formed of fibrous material comprising a surrounding side wall and a bottom for containing a particulate growing medium, wherein roots including a central root can grow down and through interstices in the bottom of the container and wherein roots including those extending outward from the central root can grow to and through interstices in the side wall, the material of the wall serving to anchor roots extending therethrough and the fibrous material being yieldable to accommodate thickening of the roots extending through said container, and a supporting member comprising a side wall of root-impervious material surrounding said side wall of the fibrous material container and having an upper portion thereof fitted to and bearing against an upper portion of said container for enabling the supporting member to support the container, said supporting member extending downward opposite to but spaced from the remaining lower portion of said side wall of the container for providing a shield for roots emerging from the side wall of the container, and a second container for plant-sustaining liquid having an opening, a substantial portion of said supporting member and said container of fibrous material therein being adapted to



extend into said second container and to form a closure for said opening but being readily removable therefrom whereby, when a growing plant has roots in the container extending through the side wall and the bottom of the container and extending downward therefrom, the plant and the container and the supporting member can readily be removed from said liquid container and restored thereto without subjecting the roots to bending or scraping stresses at points where the roots emerge through the wall of the fibrous container.

4,329,813

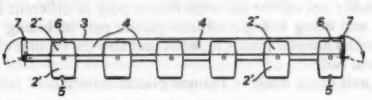
SUBSTRATUS CRATE FOR PLANT CULTIVATION AND TRANSPORTATION

Jorma Halttula, Tampere, Finland, assignor to Aaltosen Tehtaat Oy Sarvis, Tampere, Finland

Filed Jun. 3, 1980, Ser. No. 156,234

Int. Cl.³ A01G *9/02*; A47F *3/14*

U.S. Cl. 47—66 **12 Claims**



1. A substratum crate assembly for use in plant cultivation and transportation, comprising:

a latticed bottom member of substantially rectangular configuration with a pair of side walls and a pair of end walls surrounding and extending substantially perpendicular to said latticed bottom member;

a plurality of spaced supporting legs exending downwardly from each side wall for supporting said latticed bottom member above a floor surface and the like, wherein supporting legs mounted on one side wall are asymmetrically disposed relative to further supporting legs mounted on a further, parallel extending side wall;

each side wall further including outwardly extending support protrusions each vertically aligned with a support leg mounted on said respective side wall, each protrusion having a substantially flat upper surface facing away from said bottom member for supporting a supporting leg of a further crate assembly piled on said crate asembly; and

hinge means joining at least one of said end walls to said latticed bottom member for pivoting said at least one end wall to a position extending substantially parallel to said

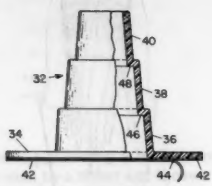
latticed bottom member to facilitate loading and unloading of said crate assembly.

4,329,814

POTTED PLANT WATER PROTECTION TECHNIQUE

Michael A. Blicha, 11535 Kelowna St., Lake View Ter., Los Angeles, Calif. 91342

Filed Mar. 7, 1980, Ser. No. 128,178
Int. Cl.³ A01G *9/02*
U.S. Cl. 47—79 **1 Claim**



1. A universal plant protection unit for assuring water supply to a conventional flower pot having a central bottom opening comprising;

a flat annular plastic member forming an outwardly extending flange of at least twice the area of said central opening for securing said protection unit to the bottom of a flower pot around the drainage hole of the pot;

a hollow tubular extension secured to the inner edge of said annular member and extending generally perpendicularly from said annular member;

an adhesive applied to the entire bottom surface of said flange for sealing said annular member to the bottom of the flower pot to the extent of said bottom surface, with the tubular extension extending upward into the pot, whereby a reservoir of water and damp earth which does not drain is maintained around the periphery of the bottom of said pot;

said tubular extension being open at the top and having a reduced diameter at the top as compared to its diameter at the bottom where it is joined to said flange, and means provided for shortening the tubular extension at preselected levels, whereby said tubular extension may be readily cut off for use with flower pots of different sizes;

said unit being a single molded plastic part including both the flat annular plastic member and also the tubular extension; and

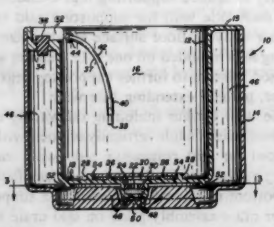
said unit being made of foamed plastic material.

4,329,815

SELF CONTROLLED WATERING PLANTER DEVICE

Allen D. Secrest, Atherton, Calif., assignor to Planter Technology Investments Limited, Mountain View, Calif.

Filed Nov. 7, 1980, Ser. No. 204,866
Int. Cl.³ A01G *27/00*
U.S. Cl. 47—80 **6 Claims**



1. In a self controlled watering planter device including a porous moisture sensor for placing within the soil, an air-tight sealable fluid reservoir and a fluid inlet port located on the interior bottom of the planter device, the improvement comprising:

a broken annular ridge, situated concentrically about the fluid inlet port,

a thin circular disk having a diameter greater than the broken annular ridge for resting on top of the broken annular ridge to protect the fluid inlet port from plant root incursion while permitting fluid flow through the breaks in the broken annular ridge; and

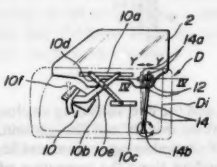
a solid annular ridge situated concentrically about the broken annular ridge, the interior diameter of the solid annular ridge being slightly greater than the diameter of the thin circular disk and—the depth of the solid ridge—being—approximately equal to the thickness of the circular disk plus the depth of the broken annular ridge.

4,329,816

WINDOW GLASS MOVEMENT GUIDE APPARATUS

Shoichi Koike, Higashimurayama, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Feb. 20, 1980, Ser. No. 123,097
Claims priority, application Japan, Feb. 27, 1979, 54/25054[U]; Mar. 14, 1979, 54/33258[U]
Int. Cl.³ E05F *11/44*
U.S. Cl. 49—350 **5 Claims**



1. A window pane movement guide apparatus comprising:

at least one guide member which is adjustably secured on a window pane, the guide member providing a hole therethrough;

at least one tubular guide track which is attached to a side of one of a car door and a car body, the guide track being slidably engaged in said hole through said guide member;

resilient connection means between a bottom portion of said tubular guide track and said one of a car door and a car body; and

regulating means provided with X-shaped crossing movable arms which are slidably connected with a bottom portion of said window pane, when operated, said regulating means for raising and lowering said window pane along a locus of movement which is axial of said tubular guide track;

so that the guide member may be adjusted relative to the window pane free of adjusting the regulating means and the guide track.

4,329,817

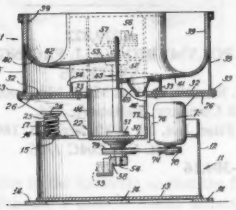
FINISHING APPARATUS

Gunther W. Balz, Kalamazoo, Mich., assignor to Roto-Finish Company, Inc., Kalamazoo, Mich.

Continuation-in-part of Ser. No. 670,643, Mar. 26, 1976, abandoned, which is a continuation of Ser. No. 554,399, Mar. 3, 1975, abandoned, which is a continuation of Ser. No. 355,343, Apr. 30, 1973, abandoned. This application Jan. 23, 1978, Ser. No. 871,175
Int. Cl.³ B24B *31/00*
U.S. Cl. 51—163.2 **5 Claims**

1. A gyratory finishing machine for finishing the surface of

parts by vibration of a part or parts and loose particulate surface finishing material therein, comprising a curvilinear finishing chamber resiliently supported by suitable support means on a fixed base frame, a substantially vertically-oriented vibrator shaft, carrying eccentric weight means mounted on said shaft for operational rotation of said shaft with said eccentric weight means in fixed radial relationship thereto, said shaft being journaled in bearings mounted in fixed relationship with respect to said finishing chamber, and a motor laterally displaced from said vibrator shaft, pulley means on the drive shaft of said



motor and pulley means driving said vibrator shaft, said pulley means being coupled by flexible endless belt means, characterized in that said motor is also supported for gyratory motion with said finishing chamber and with said vibrator shaft, being rigidly attached to said finishing chamber or its support means, and in that said pulley means driving said vibrator shaft is arranged at a point axially external of said bearings so that said belt means couples said motor drive shaft to the pulley means driving said vibrator shaft at a point axially external of said bearings.

4,329,818

BELT FOR A TROUGH BELT CLEANING APPARATUS

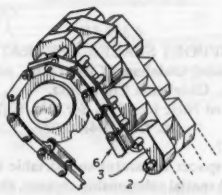
Marjan Kavcic, Metelen, Fed. Rep. of Germany, assignor to Schlick -roto-jet Maschinenbau GmbH, Metelen, Fed. Rep. of Germany

Filed Mar. 13, 1980, Ser. No. 130,140

Claims priority, application Fed. Rep. of Germany, Mar. 14, 1979, 2909893

Int. Cl.³ B24C *3/10*; B65G *17/06*

U.S. Cl. 51—422 **7 Claims**



1. An endless belt for carrying objects through a blasting agent which passes through openings in the belt, said belt comprising:

a plurality of spaced parallel cross bars extending transversely of the belt from one side thereof to the opposite thereof, ends on said cross bars defining pins,

chain links secured to and spanning said pins to define therewith a driving chain for the belt,

belt links of resilient material extending between said cross bars and spaced from each other to define openings therebetween, said belt links being disposed in transversely adjacent rows across the width of the belt,

ends on said belt links having open-ended eyes receiving therein a cross bar,

each of said end eyes partially embracing its associated cross bar and thereby connecting its associated link to a cross bar,

edges of said end eyes defining a slot to be expanded to the width of a cross bar and to spring back when said cross bar is inserted into said end eye,

said end eyes being the only means to retain said belt links on said cross bars.

4,329,819

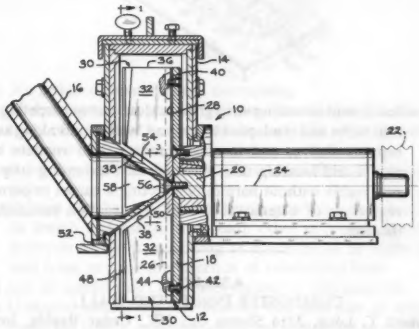
CENTRIFUGAL BLASTING APPARATUS

Harold V. May, Adrian, Mich., assignor to Ervin Industries, Inc., Ann Arbor, Mich.

Filed Apr. 18, 1980, Ser. No. 141,468

Int. Cl.³ B24C *5/06*

U.S. Cl. 51—432 **4 Claims**



1. Centrifugal blasting apparatus comprising a runnerhead mounted for rotation about its central axis, said runnerhead having a planar support surface perpendicular to said axis, a plurality of particle impeller blades mounted on said surface so as to extend generally radially of said axis, the inner ends of said blades terminating at positions short of said axis and being inclined in directions radially outwardly and away from said support surface, the inner ends of said blades being spaced apart to define a supply space for particulate material between the inner ends of said blades, and a feed spout for gravity feeding particulate material onto the inner ends of said blades, said feed spout extending downwardly at a position to one side of said blades and terminating in an outlet section located in said supply space in a closely spaced relation with said runner head, said outlet section having an outer conical surface portion positioned adjacent and in a closely spaced relation with the inner ends of said blades, said conical surface portion having a discharge opening formed therein through which particulate material will flow from said spout section onto the inner ends of said blades during rotation of said runnerhead to move said blades past said opening under the combined forces of gravity and suction induced by said blade movement.

4,329,820

MOUNTING STRIP WITH CARPET GRIPPING MEANS FOR RELOCATABLE PARTITION WALLS

Alan C. Wendt, Barrington, Ill., assignor to United States Gypsum Company, Chicago, Ill.

Filed Apr. 21, 1980, Ser. No. 141,837

Int. Cl.³ E04B *2/82*

U.S. Cl. 52—241 **18 Claims**

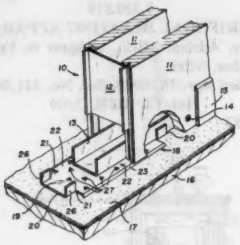
1. An integral mounting strip for relocatable partition walls comprising means for gripping subjacent carpeting, said mounting strip comprising:

a central portion having a generally rectangular configuration;

support shelves integral with said central portion and extending outwardly from marginal edges thereof;

a multiplicity of barbs extending downwardly from said mounting strip;

locating tabs extending upwardly from said central portion along said marginal edges defining an accommodating path for floor runners therebetween;



wherein said mounting strip grips said subjacent carpeting at said barbs and is adapted to support wall panels along said support shelves and to accommodate floor runners between said locating tabs, whereby said mounting strip is removable without harmfully affecting a carpet to permit relocation of a removable wall construction mountable thereon.

4,329,821

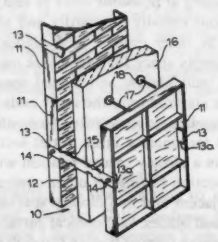
COMPOSITE INSULATED WALL

Robert T. Long, 3216 Shasta Ct., NE., Cedar Rapids, Iowa 52402, and Robert A. Weinhardt, 2037 Linden Dr., SE., Cedar Rapids, Iowa 52403

Filed Apr. 30, 1980, Ser. No. 145,150

Int. Cl.³ E04C 2/26

U.S. Cl. 52—309.12 **1 Claim**



1. An insulating wall comprising:

two spaced outer layers of form-poured concrete;

an interior layer or layers of organic or inorganic insulating material disposed between said outer layers;

a plurality of tie-rods extending perpendicularly through said insulating layer or layers and further extending substantially from respective outer surfaces of said outer layers;

a plurality of retainer means mounted to receive and immovably hold a tie-rod for fixing the lateral position of said tie-rods with respect to said insulation layer, each of said retainer means consisting of

a first cylindrical element having one flanged end,

a second cylindrical element having one flanged end, said second cylindrical element having an outer diameter substantially equal to the inner diameter of said first cylindrical element and receivable therein, said first and second cylindrical elements being inserted in said interior layer at opposite sides thereof until said respective flanges abut said interior layer,

a detent means carried in the interior of said second cylindrical element,

a pair of flanges carried on each said tie-rod receivable in said detent means in said second cylindrical element to lock said tie-rod with respect to said interior layer,

whereby said tie-rods abut said form during pouring of said concrete to retain said interior layer or layers substantially immovably during pouring and are retained in said concrete after curing for forming a mechanical connection between said interior layer or layers and each of said outer layers.

4,329,822

FILLED POLYMERIC WALL FACING UNITS AND SYSTEMS

Alexander H. Russell, Owings Mills, Md., assignor to The Burns and Russell Company, Baltimore, Md.

Filed Jun. 18, 1980, Ser. No. 160,474

Int. Cl.³ E04C 1/00

U.S. Cl. 52—309.16 **19 Claims**

1. A wall system having a facing of filled polymeric material, comprising:

(I) walls comprising masonry block having an integral molded facing layer of said filled polymeric material; and

(II) at least one corner comprising corner units comprising:

(a) a curved or angled facing surface; and

(b) a backing surface which is adapted to be incorporated into said corner of said wall system, said corner units comprising:

(i) said filled polymeric material; and

(ii) at least one mortar tie-in member, wherein said backing surface (b) has exposed areas of said cured polymeric matrix material and protruding therefrom said at least one mortar tie-in member, said tie-in member being partially embedded in said filled polymeric material.

4,329,823

SUPPORT SPACER APPARATUS

Harold G. Simpson, Oklahoma City, Okla., assignor to Encon Products, Inc., Oklahoma City, Okla.

Filed Nov. 13, 1979, Ser. No. 93,173

Int. Cl.³ E04B 2/00

U.S. Cl. 52—407 **43 Claims**

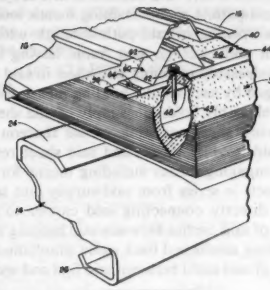
1. A support spacer apparatus supportable by a substrate in a predetermined spatial relationship thereto, the spacer apparatus comprising:

a spacer member having a first support surface and an opposite second support surface, the spacer member having a plurality of fastener apertures communicating therethrough; and

fastener means for attaching the spacer member to the substrate, the fastener means characterized as comprising:

a plurality of discrete column members secured to the spacer member before installation of the apparatus, the column members extending from the second support surface of the spacer member, each column member having a channelway communicating with one of the fastener apertures and extending to the distal end of the column member, each column member maintainable substantially in nonpenetrating engagement with the substrate in the installed position of the apparatus; and

a plurality of fastener members extendable through the fastener apertures, each fastener member extendable through the channelway of one of the column members



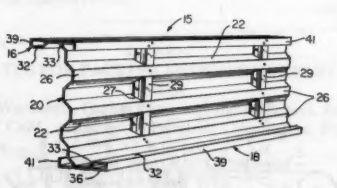
and attachable to the substrate so that the first support surface is disposed a predetermined distance from the substrate in an attached position of the support spacer apparatus to the substrate.

4,329,824

SHEET METAL BEAM

Colin F. Lowe, 5518 Aspen, Houston, Tex. 77081

Filed Dec. 17, 1979, Ser. No. 104,286
Int. Cl.[3] E04B *1/18*
U.S. Cl. 52—634 23 Claims



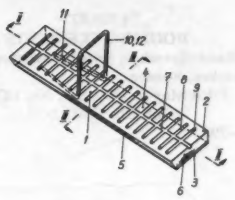
1. An improved elongated beam adapted for use in constructing a metal building and having a substantially high strength/weight ratio, said beam comprising a sheet metal panel being bent to form upper and lower first flange portions integrally connected by a web portion disposed generally perpendicular to said flange portions, said web portion of said panel having a plurality of parallel spaced and longitudinally extending integrally formed stiffening ribs, upper and lower sheet metal second flange portions disposed adjacent the corresponding said upper and lower first flange portions, a plurality of longitudinally spaced strut members extending between said upper and lower flange portions, means rigidly connecting said strut members to said web portion and said second flange portions, and at least one of said upper flange portions and at least one of said lower flange portions having a longitudinally extending and integrally formed stiffening portion.

4,329,825

REINFORCING BAR SUPPORT FOR JOINING CONCRETE STRUCTURES

Martin P. Zehtner, Eichenstrasse 14, 3074 Muri, near Bern, Switzerland

Filed Nov. 13, 1979, Ser. No. 93,190
Claims priority, application Switzerland, Dec. 18, 1978, 12820/78
Int. Cl.[3] E04B *1/38*
U.S. Cl. 52—698 3 Claims



1. An article of manufacture, comprising

a reinforcing bar support in the form of a elongated hollow body of a material having the characteristic of being anti-adhesive to concrete;

said hollow body having a front part; and four depending sides;

said front part having formed therein grooves transverse to its length and spaced from each other at predetermined intervals to facilitate drilling of apertures to be made in said front part for the insertion of reinforcing bars;

a pair of spaced apart apertures formed in said grooves;

a U-shaped reinforcing bar inserted into said pair of apertures, the legs of said reinforcing bar being bent to extend parallel to said front part; and

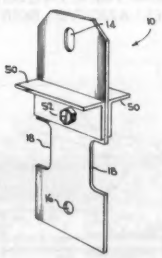
a removable cover part adapted to be placed over said sides to space said front part from the shuttering of a concrete form.

4,329,826

FASTENER FOR JOINING A STRUCTURAL MEMBER TO MASONRY OR CONCRETE

William S. Flogaus, 227 N. Royal St., Alexandria, Va. 22314, and Bill A. Blecha, 6425 Rose Hill Dr., Alexandria, Va. 22310

Continuation of Ser. No. 971,744, Dec. 21, 1978, abandoned.
This application Aug. 8, 1980, Ser. No. 176,584
Int. Cl.[3] E04B *1/38*
U.S. Cl. 52—712 9 Claims



1. A fastener adapted for joining a structural member to masonry or concrete, comprising a generally planar metallic member elongated along a longitudinal axis thereof including a hole at one end thereof and adapted for fastening to a structural member, at least a portion of the lateral edges near the end of the elongated member opposite said hole having inwardly directed scallops adapted for securing the fastener in masonry

or concrete, a second hole near the central portion of said member for attaching components to the fastener, wherein the portions of the fastener between said hole and an associated edge of the fastener as well as the portion of the fastener between the scallops have substantially equal tensile strength which is also substantially equal to the shear strength of concrete represented by the length of each of the scallops along the longitudinal direction of the fastener; and

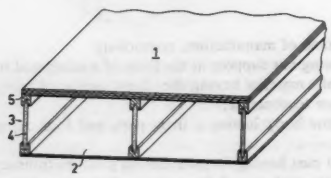
at least one L-shaped bracket attached to the member by means projecting through said second hole.

4,329,827

ROOFING ELEMENTS

Ake Thorn, Rundviksverken, Sweden, assignor to Masonite AB, Rundviksverken, Sweden

Filed May 6, 1980, Ser. No. 147,071
Int. Cl.³ F04C 2/34
U.S. Cl. 52—793 **12 Claims**



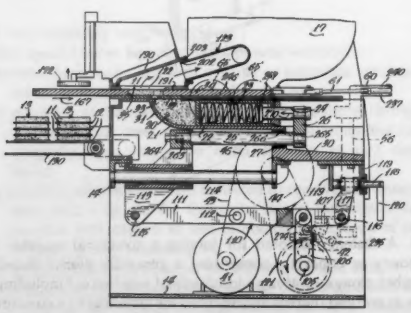
1. A construction element such as a roofing element for great span lengths comprising two substantially flat outer skins wholly spaced apart by distance members interconnecting said skins, said outer skins being of different thickness and of different materials, the upper skin being of a relatively thicker non-metallic material and the lower skin being of a relatively thinner metallic sheet material, for taking up compression stresses in the upper skin and tension stresses in the lower skin, said distance members comprising parallel composite beams of non-metallic material and having relatively wide flange portions and interconnecting relatively thin web portions, said flange portions being bonded directly to said skins by glueing or cementing in combination with nailing.

4,329,828

MOLDING APPARATUS WITH SHEET APPLICATOR

Richard C. Wagner, Frankfort, Ill., assignor to Hollymatic Corporation, Park Forest, Ill.

Division of Ser. No. 86,761, Oct. 22, 1979, Pat. No. 4,302,868.
This application Feb. 4, 1981, Ser. No. 231,578
Int. Cl.³ A22C 7/00; B65B 25/08
U.S. Cl. 53—122 **6 Claims**



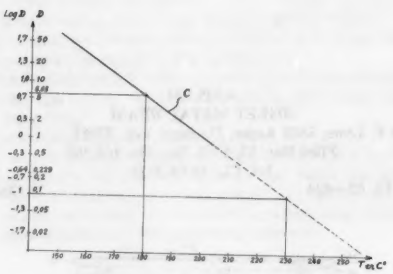
1. Apparatus for applying a separator sheet to each of a series of molded articles ejected in a path from a molding apparatus, comprising: a movable mold having a mold cavity for shaping a said article from a moldable material; moving means for moving said mold between a first position where said cavity receives said material to shape said article and a second position where said molded article is ejected from said cavity in said path; a sheet retaining means including a frame defining an opening in said path through which said article passes upon said ejecting, said frame having sheet retaining means for releasably retaining said sheet in said frame opening to be engaged by said article; holding means spaced from said frame for releasably holding a supply of said sheets; a movable carrier having sheet engaging means thereon and movable between said holding means and said sheet retaining means, said sheet engaging means including means for engaging and moving sheets in series from said supply into said frame; and means for directly connecting said carrier to said mold for movement of said carrier between said holding means and said sheet retaining means and back again simultaneously with said movement of said mold between said first and second positions.

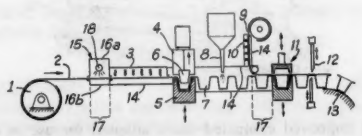
4,329,829

METHOD FOR STERILIZING A THERMO-PLASTIC STRIP USED FOR THE HOT-FORMING OF STERILE CONTAINERS AND STERILE PACKAGING INSTALLATION USING THE SAID METHOD

Roland Torterotot, Longvilliers, France, assignor to Pak Pro International N.V., Willemstad, Netherlands Antilles

Filed Mar. 31, 1980, Ser. No. 135,666
Claims priority, application France, Jan. 17, 1980, 80 01030
Int. Cl.³ B65B 55/08, 55/06
U.S. Cl. 53—426 **11 Claims**





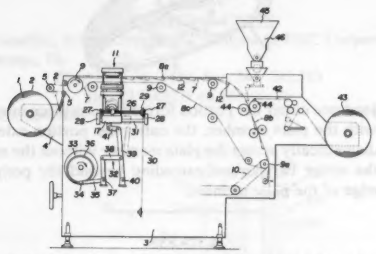
1. In a process for producing hot-formed containers comprising the steps of moving a strip of thermoplastic material forward stepwise, subjecting said strip to a softening heat treatment, hot-forming containers by drawing said softened strip in a sterile atmosphere, filling said containers in said sterile atmosphere and sealing said filled containers, an improved method for sterilizing the surface of said strip which is subsequently to constitute the inside face of said containers, which method comprises subjecting said surface to a sterilizing heat treatment by exposing said surface evenly and intermittently, in successive portions, to radiation thereby causing the temperature at said surface to become higher than that of the softening point of said thermoplastic material, each portion being continuously exposed to said radiation for at least one time period not exceeding 5 seconds.

4,329,830

METHOD AND APPARATUS FOR PACKAGING POWDERY OR PARTICLE-SIZE MATERIAL

Shozo Omori, Tokyo, Japan, assignor to Omori Machinery Co., Ltd., Tokyo, Japan

Filed Jun. 5, 1980, Ser. No. 156,874
Claims priority, application Japan, Jun. 22, 1979, 54-78111; Jun. 29, 1979, 54-88440[U]
Int. Cl.³ B65B 1/02, 1/06
U.S. Cl. 53—453 6 Claims



1. An apparatus for packaging powdery or particle-size material comprising means for continuously carrying a lower film with chucks clamping the two side edges of said lower film, said chucks being connected to endless chains which travel continuously along a substantially horizontal first passage part, a downwardly curved second passage part, and a returning third passage part, means for molding a plurality of recesses in said lower film, said molding means being movable in synchronization with the advancement of said lower film during which said recesses are formed in said lower film, means for continuously carrying an upper film against said lower film, said upper film and lower film approaching together in the shape of "V" in section at said second passage part and then being sealed together as they move down further along said second passage part, means for feeding powdery or particle-size material into said recesses between said lower film and said upper film while the lower parts of said recesses are partially covered with said upper film, and means for cutting the sealed upper and lower films with the powdery or particle-size material therebetween.

4,329,831

APPARATUS FOR PACKING ARTICLES OF FRUIT INTO BOXES

Aaron J. Warkentin, Orange Cove, and Jacob Hiebert, Reedley, both of Calif., assignors to Pennwalt Corporation, Philadelphia, Pa.

Filed May 5, 1980, Ser. No. 146,995
Int. Cl.³ B65B 5/10
U.S. Cl. 53—537 16 Claims

1. Apparatus including a supporting frame for packing objects into container means in a predetermined pattern comprising

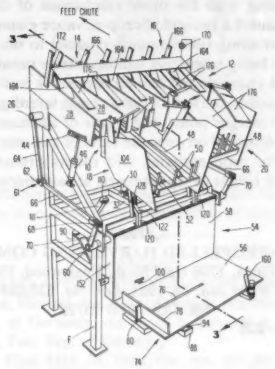
a first feeder and a second feeder adapted to receive said objects from a source,

a first packing head and a second packing head in line with and downstream of said first feeder and second feeder respectively to receive said objects therefrom for arrangement thereon in said predetermined pattern,

a table assembly below said packing heads for carrying and guiding said container means,

means for simultaneously aligning said packing heads with said table assembly,

means for tilting said aligned packing heads while simultaneously advancing said aligned table assembly toward said tilted packing heads to eject said objects therefrom into said container means, said first packing head ejecting said objects thereon into said container means to form a bottom layer therein in accordance with said predetermined pattern of said objects on said first packing head, and said second packing head, simultaneously with said first packing head, ejecting said objects thereon into container



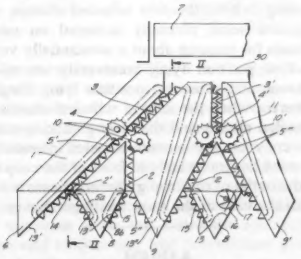
means already packed with a bottom layer from said first packing head as a top layer in accordance with said predetermined pattern of said objects on said second packing head, said top layer predetermined pattern of packed objects being complementary to and staggered with said bottom layer of packed objects.

4,329,832

PICKUP HEAD FOR LONG-STALK AGRICULTURAL CROPS GROWN IN ROW CULTURE

Frank Pietschmann, Bautzen; Günter John; Theodor Eistert, both of Neustadt; Christian Noack, Guttau; Klaus Oliva, Langburkersdorf; Bernd Zumpe, Rahtmannsdorf; Hans P. Spaida, Neustadt, all of German Democratic Rep.; Pal Boltizar, Budapest, Hungary; Istvan Fabry, Budapest, Hungary; Csongor Vida, Budapest, Hungary; Lajos Lakos, Budapest, Hungary, and Matjas Klement, Budapest, Hungary, assignors to VEB Kombinat Fortschritt Landmaschinen Neustadt in Sachsen, Neustadt in Sachsen, German Democratic Rep.

Filed Nov. 5, 1976, Ser. No. 741,743
Int. Cl.³ A01D 45/02
U.S. Cl. 56—98 7 Claims



1. A pickup head for row crops comprising a housing formed with at least four mouths respectively alignable with rows of crop at one end of said housing and a crop-discharging throat at the other end of said housing, said throat being narrower than the span of said mouths across rows of crop, respective intake channels extending from each of said mouths toward said throat, said channels merging in pairs at respective locations intermediate said ends into respective common chan-

nels extending to said mouths, each of said intake channels and the respective common channel being provided with a respective crop-advance mechanism running continuously substantially from the respective mouth to said throat, said mechanism of each intake channel forming one-sided crop-advance elements between the respective mouth and merger location and jointly forming with the other mechanism of the respective common channel a two-sided crop-advance element from said merger point along said common channel to said throat, said mechanisms being respective endless chains running along the walls of said channels and having respective teeth penetrating into said channels, the teeth of said chains interdigitating at and beyond said merger point, and a pair of substantially upright feed rollers disposed on opposite sides of said merger point for advancing the crop material, said rollers extending substantially the full height of the channels at said merger point.

4,329,833

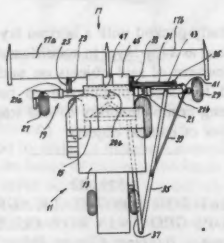
SELF-PROPELLED HARVESTING COMBINE

Homer D. Witzel, 1700 Gulf Blvd., Englewood, Fla. 33533

Filed Jan. 14, 1981, Ser. No. 225,002

Int. Cl.³ A01D *75/22*

U.S. Cl. 56—228 **18 Claims**



1. A self-propelled harvesting combine comprising; a crop treatment means having and inlet and supported on a first wheeled chassis, crop gathering means having an outlet, and crop separating means, wherein the wheeled chassis supports a power source for propulsion of the combine, operation of the crop separating and operation of the crop gathering means; and the crop gathering means is supported on a second wheeled chassis; said second wheeled chassis being pivotally mounted to the first wheeled chassis to be movable between a first position lying beside the first wheeled chassis and a second position trailing behind the first wheeled chassis; said crop gathering means being pivotally mounted on said second wheeled chassis for rotation about a substantially vertical axis between a first position lying transversly on said second wheeled chassis and a second position lying longitudinally thereon; wherein when the second wheeled chassis is beside the first wheeled chassis and the crop gathering means is located transversly on the second wheeled chassis, the crop gathering means lies transversly in front of the crop treatment means and the outlet of the crop gathering means is in communication with the inlet of the crop treatment means.

4,329,834

SAFE BLADE STRUCTURES FOR MOWING VEGETATION

Glenn C. Hetrick, 2045 E. Parkway Dr., Altoona, Pa. 16602

Filed Oct. 21, 1980, Ser. No. 199,388

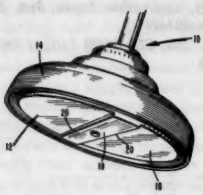
The portion of the term of this patent subsequent to Oct. 23, 1996, has been disclaimed.

Int. Cl.³ A01D *55/18*

U.S. Cl. 56—295 **33 Claims**

1. In an apparatus for mowing vegetation, the apparatus including a drive shaft for imparting rotary movement to a cutting structure mounted therewith, the cutting structure comprising:

a disc-like plate member mounted relative to the drive shaft for rotation therewith; and,



at least one cutter bar portion formed as one piece integrally with the plate member, the cutter bar portion extending diametrically across the plate member without the ends of the cutter bar portion extending beyond the peripheral edge of the plate member.

4,329,835

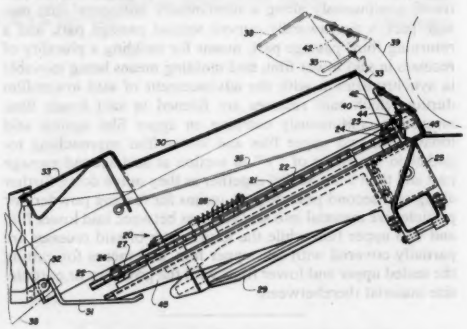
LATCH FOR CORN HARVESTING HEADER

Richard A. Pucher, Leola, Pa., assignor to Sperry Corporation, New Holland, Pa.

Filed Feb. 6, 1981, Ser. No. 232,278

Int. Cl.³ A01D *75/18, 45/00*

U.S. Cl. 56—320.1 **8 Claims**



1. In a corn harvesting header having a plurality of row units for receiving and harvesting rows of corn, each said row unit having an elongated passageway disposed in a fore-and-aft direction, gathering means operable within said passageway to convey crop rearwardly for further harvesting treatment and drive means for powering said gathering means, said header further having at least one crop divider situated between adjacent passageways, said at least one crop divider being operable to guide crop toward said adjacent row units and to protect the corresponding said drive means from debris becoming engaged therewith, said at least one crop divider having a hood member pivotally mounted on said header for rotative movement in a generally vertical plane about a substantially horizontal pivot axis between a fixed operative position and an open access position so as to provide access to said drive means for service and maintenance thereof, said hood member having a latching means remotely spaced from said pivot axis for releasably securing said hood member in said fixed operative position relative to said pivot axis, an improved latching means comprising:

a latch lock member affixed to the corresponding said row unit and having an opening therein;

a latch affixed to said hood member and positioned such that when said hood member is moved to said operative position said latch is engageable with said latch lock member

through said opening to releasably secure said hood member in said fixed operative position;

a stop affixed to said hood member and movable therewith; and

guide means mounted on said corresponding row unit for operative communication with said stop, such that said hood member is guided into a position wherein said latch is aligned with the opening in said latch lock member for proper engagement therebetween.

4,329,836

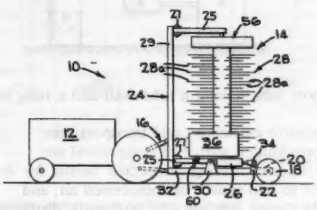
HARVESTING UNITS

Roy Scudder, Araraquara, Brazil, assignor to FMC Corporation, Chicago, Ill.

Filed Oct. 31, 1980, Ser. No. 202,517

Int. Cl.³ A01D *46/00, 46/06*

U.S. Cl. 56—330 **1 Claim**



1. A tractor drawn harvester including a tined shaker unit that rapidly strikes fruit bearing branches of trees or bushes to dislodge fruit, the shaker unit being operatively mounted on a frame structure having a generally horizontal portion and vertical portion mounting the shaker unit for movement transverse to a row of trees being harvested, the frame structure having a hitch at its forward end connectable to a tractor and a pair of wheels at its trailing end, the improvement in said frame structure comprising a platform mounting a power unit providing pressure fluid for operating the shaker unit, said platform being mounted on the frame structure and being displaceable transversely relative to a row of trees, selectively operable means for moving the shaker unit toward the row of trees so that the tines achieve the desired penetration, and means for displacing said power unit transversely in a direction opposite to the direction in which the shaker unit is moved to thereby maintain the resultant center of gravity between the wheels.

4,329,837

AGRICULTURAL IMPLEMENT FOR WORKING CROP LYING ON THE FIELD

Hermanus H. Vissers, Nieuw-Vennep, and Jan Winkel, Sassenheim, both of Netherlands, assignors to Expert N.V., Willemstad, Curacao, Netherlands Antilles

Filed Aug. 8, 1979, Ser. No. 64,885

Claims priority, application Netherlands, Sep. 1, 1978, 7809023

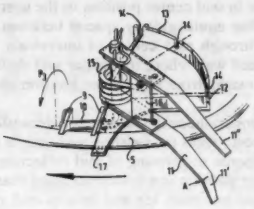
Int. Cl.³ A01D *79/00*

U.S. Cl. 56—370 **14 Claims**

1. An agricultural implement for raking a crop such as hay, comprising the combination of:

a frame, a carrier rotatably mounted on said frame about a generally upright axis and means for rotatably driving said carrier about said axis;

a plurality of tine assemblies mounted on said carrier in a circular pattern concentric with said axis whereby each tine assembly is subjected to centrifugal force as the carrier is rotated, each tine assembly including at least one tine element and pivot means freely pivoting such tine element about an upright axis to swing outwardly of the carrier to operative position in response to said centrifugal



force, and spring means separate from each tine but engaging same to oppose inward deflection of such tine.

4,329,838

METHOD AND APPARATUS FOR DETWISTING CLOTH

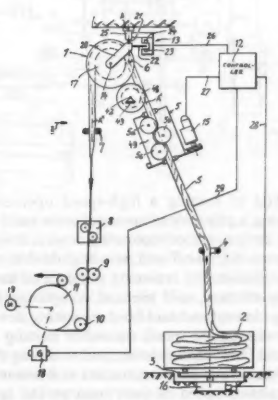
Ludwig Zerle, Mering, and Heinz Schmidt, Stadtbergen, both of Fed. Rep. of Germany, assignors to Erhardt & Leimer KG, Augsburg, Fed. Rep. of Germany

Filed Mar. 26, 1980, Ser. No. 134,268

Claims priority, application Fed. Rep. of Germany, Mar. 28, 1979, 2912340

Int. Cl.³ D06C *3/06, 29/00*; G01L *5/00*

U.S. Cl. 57—1 UN **10 Claims**



1. An apparatus for detwisting a randomly twisted but flattenable textile web, said apparatus comprising:

a container adapted to hold a supply of said web;

an upstream guide adjacent said container and a downstream guide spaced from said upstream guide;

a deflector having a curved deflecting guide surface having a center or curvature and defining with said guides a path having a straight upstream leg between said surface and said upstream guide and a straight downstream leg between said surface and said downstream guide and misaligned with said upstream leg;

means downstream of said downstream guide for pulling said web from said supply along said path to pass sequentially through said upstream guide, over said surface, and through said downstream guide;

detwisting means along said upstream leg for twisting said web in said upstream leg about the longitudinal axis of said upstream leg in either rotational sense;

support means for said deflecting surface including a pivot defining an eccentric pivot axis for pivoting of said de-

flecting surface about said eccentric pivot axis from a center position in which said surface, said legs, and said pivot all generally lie in a plane, said pivot being spaced in said plane in said center position to the upstream side of a straight line equiangularly spaced between said legs and passing through said center of curvature, whereby any twist in said web where it engages said deflecting surface will pivot same from said center position about said pivot axis; and

control means connected between said detwisting means and said support means for twisting said web in said upstream leg in response to pivoting of said deflecting surface from said center position in a rotational sense that detwists said web in said upstream leg and returns said surface to said center position.

4,329,839

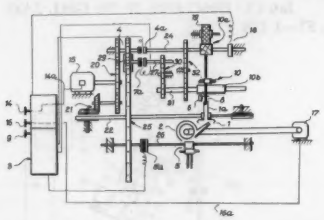
METHOD OF AND APPARATUS FOR STARTING AN OPEN-END SPINNING MACHINE

Jaroslav Dykast, Usti nad Orlici; Karel Mikulecky, Chocen, and Miloslav Tyl, Usti nad Orlici, all of Czechoslovakia, assignors to Vyzkumny ustav bavlnarsky, Usti nad Orlici, Czechoslovakia

Filed Apr. 14, 1980, Ser. No. 139,807

Int. Cl.³ D01H *15/00, 1/30*

U.S. Cl. 57—263 **5 Claims**



1. A method of starting a high-speed open-end spinning machine having a plurality of spinning units each including a fiber feeding device, a fiber separating device, a twist forming element, a yarn taking-off and winding device, and a yarn reversing mechanism for returning a yarn end back into the twist forming element, said method comprising setting said twist forming element and said fiber separating device in operation at normal spinning speed, thereafter starting the feeding of fibers by said fiber feeding device and returning the yarn end back by said yarn reversing mechanism at a lower speed than the normal take-up speed of yarn spun by the spinning machine, and thereafter taking-up yarn at said normal spinning speed by the machine and winding it by the winding device.

4,329,840

METHOD OF AND APPARATUS FOR FEEDING A FIBRE TOW TO A TEXTILE MACHINE

Hermann Gasser, Zurich; Paolo Di Benedetto, Uster, and Johann W. Ferri, Greifensee, all of Switzerland, assignors to Luwa AG, Zurich, Switzerland

Filed Jun. 30, 1980, Ser. No. 164,321

Claims priority, application Switzerland, Jul. 10, 1979, 6417/79

Int. Cl.³ D01H *15/00, 13/04;* **B65H** *51/16, 17/32*

U.S. Cl. 57—279 **6 Claims**

1. A method of feeding a fiber sliver through a tube to a textile machine, comprising the steps of:

creating a primary vortical flow at a predetermined location of a tube;

creating a feed flow at an infeed location of the tube located upstream of said predetermined location for feeding a sliver through the tube;

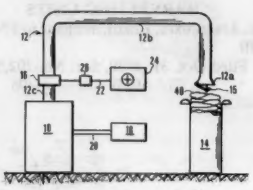
holding in readiness the sliver at the infeed location;

seizing the sliver by means of the feed flow and transporting such sliver through the tube;

inducing in the feed flow by means of the primary vortical flow a secondary vortical flow; and

imparting twist to the sliver by the action of the primary vortical flow and the secondary vortical flow upon the surface of the sliver while the sliver passes through the tube.

2. An apparatus for feeding a sliver to a textile machine from a sliver can, comprising:



a transport tube having a tube wall and a tube lengthwise axis;

an air injector carried by said transport tube;

means providing a source of compressed air;

said air injector having connector means for connection thereof to said source of compressed air; and

air guide means substantially uniformly distributed about said tube wall and piercingly extending through said tube wall for passing compressed air from said source into said transport tube in order to form a vortical flow therein for imparting twist to the sliver as it moves through the transport tube.

4,329,841

METHOD FOR THE PRODUCTION OF A SYNTHETIC CREPE YARN

Wilhelm Mang, Eschau, Fed. Rep. of Germany, assignor to Akzona Incorporated, Asheville, N.C.

Filed Jul. 12, 1979, Ser. No. 57,244

Claims priority, application Fed. Rep. of Germany, Jul. 20, 1978, 2831868

Int. Cl.³ D02G *1/02*

U.S. Cl. 57—288 **7 Claims**

1. A process for making a highly twisted crepe effect yarn of reduced twisting tendency comprising the steps in a simultaneous draw-falsetwisting process of feeding a yarn of synthetic polymeric filaments to a first heating zone and heating the yarn to below its melting point; directing the yarn to a falsetwisting device and backing the twist thereby imparted up to said first heating zone; and drawing yarn from the falsetwist device at a speed at least 1.08 times the determined first speed, the improvement comprising maintaining the yarn tension S_1, before the falsetwist device less than 2 cN/tex and the ratio of yarn tension after the falsetwist device S_2 to S_1 (S_2/S_1) greater than about 2.2, drawing yarn from the falsetwist device at a ratio at least about 0.3 less than the drawing ratio for conventional

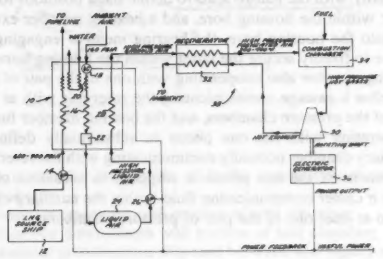
bulk-textured yarns and falsetwisting the yarn 10–40 percent less than the twist level for conventional bulk-textured yarns.

4,329,842

POWER CONVERSION SYSTEM UTILIZING REVERSIBLE ENERGY OF LIQUEFIED NATURAL GAS

Robert L. Hoskinson, deceased, late of Pacific Palisades, Calif. (by Violet Vivian Hoskinson, heir), assignor to Hans D. Linhardt, Newport Beach, Calif.

Filed Jul. 2, 1980, Ser. No. 165,378
Int. Cl.[3] F02C 7/00; F17C 7/02
U.S. Cl. 60—39.46 G 23 Claims



1. A power generating system adapted for recovering reversible energy contained in liquefied natural gas, the system comprising in combination:

liquid air generating means for liquefying air supplied to the liquid air generating means from the ambient environment;

first heat exchange means included in the liquid air generating means for exchanging heat of the air supplied into the liquid air generating means with liquefied natural gas thereby vaporizing the natural gas for release into a pipeline, storage tank and the like;

a pump pressurizing the liquid air to a high pressure;

second heat exchange means included in the liquid air generating means for exchanging heat of the ambient air with liquid air and for generating high pressure gaseous air from the liquid air, and

power generating means for receiving the high pressure gaseous air and a supply of fuel and for combusting the fuel thereby generating useable power, said useable power including a significant portion of the reversible energy contained in the liquefied natural gas.

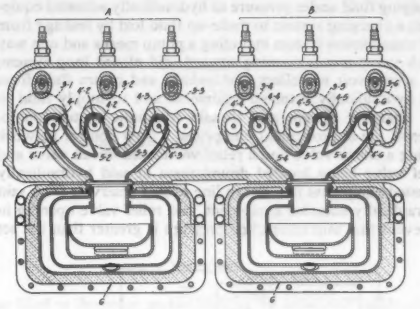
4,329,843

EXHAUST PASSAGE SYSTEM OF SIX CYLINDER ENGINES

Kazuo Inoue, Tokyo, and Hiroshi Kogure, Tokorozawa, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 729,945, Oct. 6, 1976, abandoned, and Ser. No. 932,457, Aug. 10, 1978, abandoned. This application Aug. 6, 1980, Ser. No. 175,716
Claims priority, application Japan, Oct. 8, 1975, 50-121231; Oct. 21, 1975, 50-125938
Int. Cl.[3] F01N 3/24, 7/10
U.S. Cl. 60—274 14 Claims

1. A six cylinder internal combustion engine having first and second groups of three in-line combustion chambers, each of the groups having a central combustion chamber and two flanking combustion chambers, one on each side of the central combustion chamber, each combustion chamber having an intake valve port and an exhaust valve port, each of the exhaust valve ports of the flanking combustion chambers being positioned adjacent the central combustion chamber, exhaust reaction chamber means, and first and second confluence members joining said exhaust valve ports of said first and second groups to said exhaust reaction chamber means, respectively.

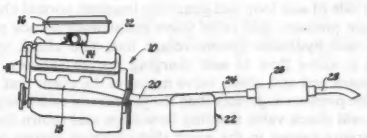


4,329,844

DIESEL EXHAUST FILTER-INCINERATOR

Farhang Shadman, Tucson, Ariz., and Louis Hegedus, Grosse Pointe Woods, Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed May 16, 1980, Ser. No. 150,309
Int. Cl.[3] F01N 3/02
U.S. Cl. 60—311 3 Claims



1. A diesel engine exhaust particulate filter comprising

a housing defining a filter chamber having an inlet and an outlet, said housing having heat transmitting wall means in said chamber defining therein a reflexive flow path from the inlet to the outlet, said flow path having separate adjacent upstream and downstream portions in heat exchange relation to one another through said wall means,

said flow path containing a depth type filter medium in said upstream and downstream portions and capable of collecting along its length particulates from diesel exhaust gases passed therethrough, said filter medium being further capable of withstanding temperatures adequate to incinerate the collected particulates therein,

whereby upon heating collected particulates to incineration temperature during operation with an associated diesel engine, heat transfer through the wall means between the upstream and downstream portions of the filter chamber flow path is operative to moderate combustion temperatures in the hotter downstream portion and to promote more rapid incineration in the cooler upstream portion.

4,329,845

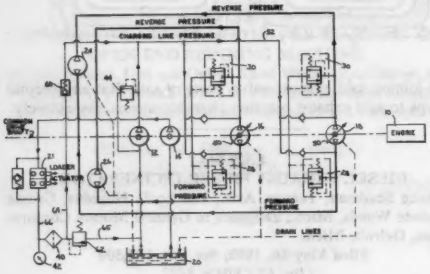
AUGMENTED CHARGING SYSTEM FOR A HYDROSTATIC TRANSMISSION

Donald J. Parquet, and Carl O. Pedersen, both of Burlington, Iowa, assignors to J. I. Case Company, Racine, Wis.

Filed Jan. 24, 1980, Ser. No. 114,903
Int. Cl.[3] F15B 13/06; F16H 39/04
U.S. Cl. 60—422 5 Claims

1. In an off-road machine used in excavating operations and the like, having: a closed loop hydrostatic power transmission

system to propel said machine, said transmission defining a minimum allowable operating pressure in the low pressure side of said loop; an open center hydraulic system including a pump supplying fluid under pressure to hydraulically actuated equipment; a charging system to make-up fluid lost by leakage from said transmission system including a pump means and one way check valve means opening toward said closed loop system; and a reservoir to collect said leakage and return fluid from said hydraulically actuated equipment and to supply fluid to said charging system and to said hydraulic system pump, wherein the improvement comprises: a flow control network having a check valve and a relief valve, said check valve and relief valve being located downstream of said hydraulically actuated equipment in a return line to said reservoir from said hydraulically actuated equipment, said relief valve opening in the event that said return line pressure is greater than the set



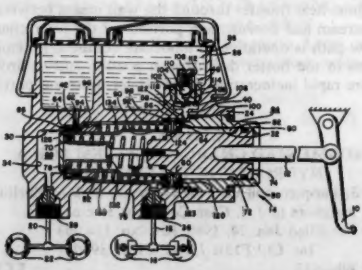
point of said relief valve, said set point being generally greater than said minimum allowable operating pressure in the low pressure side of said loop and generally less than normal charging system pressure, said relief valve maintaining a back pressure on said hydraulic system return line, said check valve opening to allow flow to said charging system between said pump means and said check valve means in the event that said return line pressure is greater than the pressure in said charging system, said check valve shutting flow from said return line to said charging system in the event that charging system pressure exceeds said return line pressure thereby preventing loss of make-up fluid through said return line and said relief valve to said reservoir, whereby in the event that the pressure of said charging system is less than the pressure in said return line said check valve opens to supply make-up fluid, said check valve and said relief valve thereby augmenting said charging system.

4,329,846

FAST FILL DISPLACEMENT MASTER CYLINDER

Robert F. Gaiser, Stevensville, Mich., assignor to The Bendix Corporation, Southfield, Mich.

Filed Mar. 17, 1980, Ser. No. 130,671
Int. Cl.³ B60T *11/20*
U.S. Cl. 60—562 **12 Claims**



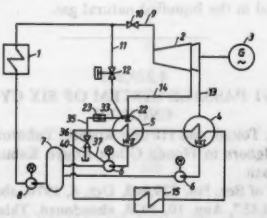
1. In a master cylinder, the combination of, a housing defining a reservoir and a bore communicating with the reservoir, the housing also including a pair of outlets leading to respective brake circuits, a sleeve disposed within the bore and forming a bore therethrough, a pair of pistons disposed within the sleeve bore, one of the pair of pistons being engageable with an input member to move within the sleeve bore in response to actuation of the input member, the other piston defining a cavity for receiving the one piston and being movable in response to movement of the one piston, the sleeve extending between a pair of seals which cooperate with said pair of pistons respectively, to substantially define a pair of pressure chambers, each of the pair of pressure chambers communicating with a separate brake circuit, the sleeve cooperating substantially with the pair of seals to define fixed positions for the latter within the housing bore, and a bearing member extending into the housing bore, the bearing member engaging the sleeve to fixedly secure the latter within the housing bore, the bearing member also cooperating with one of the pair of seals to define a passage communicating the reservoir with at least one of the pressure chambers, and the bearing member further cooperating with the one piston to substantially define an auxiliary chamber normally communicating with the reservoir, movement of the one piston in response to actuation of the input member communicating fluid within the auxiliary chamber to at least one of the pair of pressure chambers.

4,329,847

BACK PRESSURE TURBINE FOR A DISTRICT HEATING PLANT HAVING A CUT-OFF VALVE BETWEEN THE TURBINE AND THE CONDENSER

Arne Raström, Finspong, Sweden, assignor to Stal-Laval Turbin AB, Sweden

Filed Apr. 18, 1980, Ser. No. 141,732
Claims priority, application Sweden, Apr. 23, 1979, 7903521
Int. Cl.³ F01K *17/02*
U.S. Cl. 60—648 **8 Claims**



1. An improved turbine and heating plant apparatus, comprising:

a boiler for producing steam;

a turbine arranged to be driven by said steam;

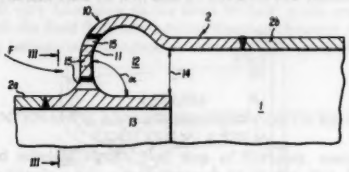
at least one condenser having a steam inlet opening for receiving steam from said turbine, said condenser being adapted for heating water for a separate heating system; and

valve means arranged inside said condenser for closing said steam inlet opening.

4,329,848
COOLING OF COMBUSTION CHAMBER WALLS USING A FILM OF AIR

Jacques E. J. Caruel, Maincy; Philippe M. D. Gastebois, and Simone Coutor, both of Melun, all of France, assignors to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation, Paris, France

Filed Feb. 29, 1980, Ser. No. 125,915
Claims priority, application France, Mar. 1, 1979, 79 05317
Int. Cl.[3] F23R *3/08*
U.S. Cl. 60—757 4 Claims



1. A device for cooling the wall of a combustion chamber comprising:

at least one upstream wall portion of said chamber;

at least one downstream wall portion of said chamber;

an annular protuberance disposed between and rigidly connected to each said at least one upstream wall portion and each said at least one downstream wall portion;

said protuberance further comprising a frontal wall formed about an upstream portion of said protuberance such that said frontal wall is substantially perpendicular to said at least one upstream wall portion of said chamber;

said protuberance having a plurality of holes formed therein for the intake of said cooling air and defining at least three concentric radially offset rows of said holes, said holes having diameters not greater than 1.5 mm such that said cooling air flows through said holes in a path substantially parallel to the axis of said combustion chamber;

said protuberance further defining an annular pocket;

each said at least one downstream wall portion further comprising a downstream extension forming an annular tongue;

said annular tongue defining an annular slot between an inner axial surface portion of each said at least one downstream wall and an outer axial surface portion of said annular tongue such that the radial height of said protuberance is from 1.5 to 2.5 times the radial height of said slot, said slot having a radial height from 1.5 mm to 8 mm; and

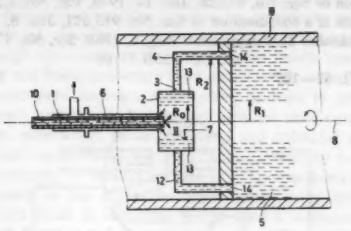
said slot providing an unobstructed substantially linear flow path for said cooling air, such that said cooling air flows directly through said holes in said frontal wall, through said annular pocket, and directly through said slot.

4,329,849
METHOD AND APPARATUS FOR REPLENISHING THE HELIUM BATH IN THE ROTOR OF A SUPERCONDUCTING GENERATOR

Albert Hofmann, Karlsruhe, and Christoph Schnapper, Erlangen, both of Fed. Rep. of Germany, assignors to Kernforschungszentrum Karlsruhe Gesellschaft mit beschränkter Haftung, Karlsruhe, Fed. Rep. of Germany

Filed Jun. 9, 1980, Ser. No. 157,807
Int. Cl.[3] F17C *7/02*
U.S. Cl. 62—55 2 Claims

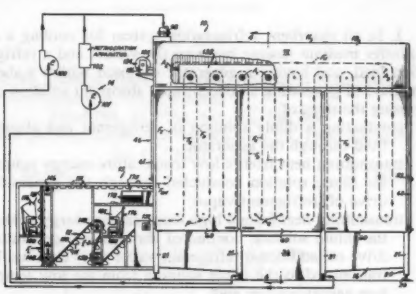
1. In a method for replenishing a helium bath in the superconducting rotor of an electrical machine, in which bath liquid helium boils at subatmospheric pressure, with liquid helium from a helium reservoir, the liquid helium in the reservoir being at ambient pressure and part of the liquid helium changing to the vapor phase during flow from the reservoir to the bath, which method includes introducing liquid helium into the bath at a distance from the rotor axis of rotation, the improvement comprising separating the liquid and vapor phases of the helium flowing from the reservoir to the bath in a phase separator fixed to the rotor, and extracting the separated vapor phase from the separator, and wherein said step of introducing is carried out by conducting only the liquid phase from the separator to the bath.



4,329,850
FOOD PRODUCT CHILLER

Russell F. Drummond, 532 Embry La., Marietta, Ga. 30066

Division of Ser. No. 90,333, Nov. 1, 1979, Pat. No. 4,277,954.
This application Oct. 8, 1980, Ser. No. 195,013
Int. Cl.[3] F25D *13/06*
U.S. Cl. 62—63 4 Claims



1. A method of cooling edible food products comprising the steps of:

moving the food products successively along a serpentine path through an enclosure where the serpentine path is arranged in a plurality of spaced apart, substantially vertically extending flights along each of which a plurality of the food products are sequentially moving at any one time; and

directing a heat transfer liquid into the enclosure so that the heat transfer liquid flows downwardly through the enclosure under the influence of gravity while confining the heat transfer liquid flow in separate, spaced apart, vertically extending liquid paths where each of the liquid paths coincides with one of the vertically extending flights of the serpentine path so that substantially all of the heat transfer liquid flowing down each of the liquid paths sequentially flows downwardly from food product to food product moving along the vertically extending flight of the serpentine path coinciding with the liquid path to sequentially contact all of the food products moving along such flight of the serpentine path and thus maximize the heat transfer between the heat transfer liquid and the food products each time the heat transfer liquid flows downwardly through the enclosure.

4,329,851

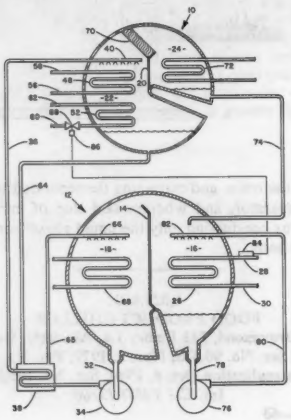
ABSORPTION REFRIGERATION SYSTEM

Joseph R. Bourne, Syracuse, N.Y., assignor to Carrier Corporation, Syracuse, N.Y.

Division of Ser. No. 49,028, Jun. 14, 1979, Pat. No. 4,246,762, which is a continuation of Ser. No. 913,621, Jun. 8, 1978, abandoned. This application Aug. 4, 1980, Ser. No. 174,787

Int. Cl.³ F25B 15/00

U.S. Cl. 62—101 7 Claims



1. In an absorbent refrigeration system for cooling a heat transfer medium passing between the system and a refrigeration load, and having a generator enclosed within a shell, a method of generating a concentrated absorbent solution comprising the steps of:

conducting a dilute solution of refrigerant and absorbent fluid through the generator;

transmitting heat from a low temperature energy source to the dilute solution conducted through the generator to drive off refrigerant vapor;

transmitting heat from a high temperature energy source to the dilute solution conducted through the generator to drive off additional refrigerant vapor after heat has been transmitted to the dilute solution from the low temperature energy source; and

controlling the amount of heat transmitted to the dilute solution from the high temperature energy source in response to the difference between the heat required to produce the desired concentrated solution and the heat transmitted to the solution from the low temperature energy source.

4,329,852

OPEN TOP MULTIBAND REFRIGERATED DISPLAY CASE

Fayez F. Ibrahim, Niles, and Arthur Perez, Buchanan, both of Mich., assignors to Tyler Refrigeration Corporation, Niles, Mich.

Filed Jan. 31, 1979, Ser. No. 8,111

Int. Cl.³ A47F 3/04

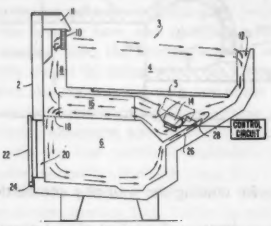
U.S. Cl. 62—256 38 Claims

1. An open top refrigerated display case comprising:

an upper display portion for displaying products to be refrigerated;

a lower storage portion for storing products to be refrigerated;

cooling means for cooling both said display portion and said storage portion of said display case, said cooling means including means for establishing a first band of air encircling said display portion, said means for establishing said first air band including a first air conduit passing around said display portion of said display case, said first air conduit having a first air outlet through which air can be expelled from said first air conduit and a first air inlet through which air can enter said first air conduit with said first air outlet and said first air inlet being located at opposite ends of said display case so as to direct air across the opening in the top of said display case and in alignment so that air leaving said first air outlet is directed towards and received by said first air inlet, first air circulating means for circulating air along said first air conduit during a refrigeration cycle such that air is expelled from said first air outlet and received by said first air inlet thereby establishing a first air curtain along the opening in the top of said display case, and refrigeration means arranged within said first air conduit for refrigerating the air of the first air band passing along said first air conduit during the refrigeration cycle of operation of said display case so as to form a refrigerated air band; and,



first means for diverting a portion of the air of the refrigerated air band out of said first air conduit and enabling such diverted refrigerated air to pass from said first air conduit into said storage portion for cooling said storage portion, said first diverting means being located within said first air conduit at a location downstream of said first air circulating means and said refrigeration means.

4,329,853

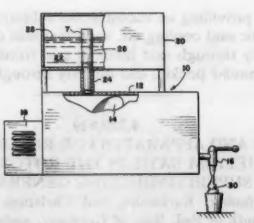
MIX OVER-RUN DEVICE

John W. Mills, 301 S. Idaho, Columbus, Kans. 66725

Continuation of Ser. No. 45,130, Jun. 20, 1979, abandoned. This application May 18, 1981, Ser. No. 264,349

Int. Cl.³ A23G 9/00

U.S. Cl. 62—308 5 Claims



1. In an apparatus for freezing and dispensing a soft confectionery product, the apparatus including a freezing and mixing chamber, a liquid product reservoir and a communicating line between the reservoir and the freezing chamber; the improvement comprising a mix over-run control device removably positioned in said communicating line for supplying a proper proportion of air and liquid to the freezing chamber, the device comprising:

upper and lower tubular members removably joined together in axial alignment with a common central passageway, passing through both members, the lower member

being substantially positioned within said communicating line with the upper end of the upper member extending above the maximum fluid level in the reservoir, so as to provide air to the passageway at all reservoir levels;

a vortex chamber concentrically positioned within the central passageway; and

a plurality of lateral apertures passing through one of said tubular members tangentially joining the vortex chamber with the reservoir whereby fluid entering the apertures from the reservoir causes a vortex flow of fluid in the chamber and down the sides of the central passageway in the lower tubular member with an open air passage in the center thereof, the velocity of fluid flow in the chamber will vary according to the head of fluid in the reservoir with the fluid flow rate into the freezing chamber remaining substantially constant at varying reservoir levels.

4,329,854

MAINTENANCE AND PROTECTION DEVICES FOR COOLING PLANTS

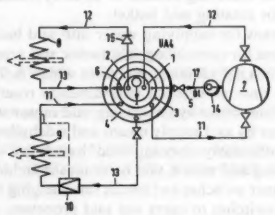
Manfred Schmidt, Berlin, Fed. Rep. of Germany, assignor to Erich Schultze KG. Alt-Heiligensee 44, Berlin, Fed. Rep. of Germany

Filed Jul. 22, 1980, Ser. No. 171,186

Claims priority, application Fed. Rep. of Germany, Jul. 26, 1979, 2930404

Int. Cl.³ F25B *43/02*

U.S. Cl. 62—470 **4 Claims**



1. In a single circuit refrigeration plant in which a gas stream, while flowing in the circuit is compressed by a compressor which injects oil into the gas stream while compressing the gas, circulated from the pressure side of the compressor and through a condenser, then through an evaporator and finally back to the suction side of the compressor,

an apparatus improvement, comprising:

a housing having wall means defining four concentrically located contiguous compartments, each being interposed in said single circuit at a respectively different relative location as follows:

(a) a first compartment being interposed between the pressure side of the compressor and the condenser;

(b) a second compartment being interposed between the first compartment and a third compartment;

(c) said third compartment being interposed between the evaporator and the suction side of the compressor; and

(d) a fourth compartment being interposed between the condenser and the evaporator;

there being further provided in said circuit a degassing valve between the second and third compartments, a non-return valve between the first compartment and the condenser, and a cut-off valve between the fourth compartment and the evaporator;

there being further provided a float valve means connecting said first compartment with the second compartment for delivering pressurized oil separating from said compressed gas stream in said first compartment to said second compartment; conduit means for delivering degassified oil collecting in the second compartment back to the compressor;

the first compartment being axially centrally located and directly ringed by both the second and third compartments which axially adjoin one another, and the fourth compartment ringing the third compartment,

so that, in operation;

as the compressed gas stream enters the first compartment the pressurized oil therein separates therefrom and the resultingly de-oiled compressed gas stream flows to and through the condenser and back to the fourth compartment as a freezing mixture fluid which while in the fourth compartment becomes undercooled at least in part by indirect heat transfer by contact with the third compartment; meanwhile, the oil degassed and collected in the second compartment is cooled at least in part by indirect heat transfer by contact with the third compartment and is returned to the compressor; the undercooled freezing mixture fluid is collected in the fourth compartment which flows to and through the evaporator, then flows as a liquid component and a gas stream component to the third compartment, in which the liquid component is separated and combined with the gas that was degassed from the oil in the second compartment, and the remaining gas stream is returned to the suction side of the compressor,

so that the four compartments serve the following principal functions:

oil is separated from compressed gas in the first compartment;

separated oil is degassed in the second compartment;

liquid is separated from the gas stream in the third compartment; and fluid coming from the condenser is collected in the fourth compartment.

4,329,855

HEAT PUMP

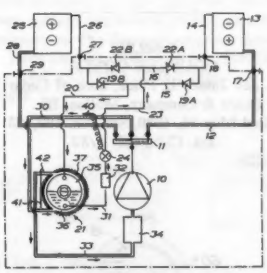
Sven A. H. Larsson, Malmö, Sweden, assignor to Industriventilation Produkt AB, Vaxjo, Sweden

Filed Feb. 17, 1981, Ser. No. 234,798

Claims priority, application Sweden, Feb. 18, 1980, 8001275

Int. Cl.³ F25B *43/02*

U.S. Cl. 62—473 **2 Claims**



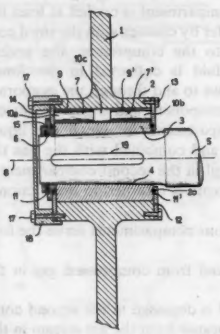
1. In a heat pump with a circulation system for a refrigerant including a compressor, a condensor, a choke member, and an evaporator, and further including a receiver comprising a vessel connected in series between the outlet of the condensor and the choke member for receiving the refrigerant leaving the condensor, the return passage from the evaporator to the compressor being arranged for heat exchange between the refrigerant passing through the receiver and the return passage, respectively, the improvement wherein the receiver is arranged as a jacket heat exchanger with an outside jacket surrounding the vessel, and wherein said jacket is connected in the return passage as a liquid separator with the inlet of the return passage connected to the jacket at the bottom thereof and with the outlet of the return passage connected to the jacket at the top thereof.

4,329,856

DEVICE FOR COUPLING IN ELASTIC FASHION TWO ROTATING COAXIAL PIECES, RESPECTIVELY INTERIOR AND EXTERIOR, HAVING A CYLINDRICAL INTERFACE

Robert C. Lucas, Paris, France, assignor to Etablissements Georges Lucas, Neuville-Saint-Remy, France

Filed Oct. 29, 1979, Ser. No. 89,222
Claims priority, application France, Nov. 2, 1978, 78 31022; Mar. 16, 1979, 79 06727
Int. Cl.³ F16D 3/56
U.S. Cl. 464—82 7 Claims



1. A device for interlocking in elastic fashion two coaxial rotating pieces, respectively interior and exterior, having a cylindrical interface, comprising: split pins which are introduced into seatings formed parallel to the rotation axis at the interface of the two pieces, wherein the pins are hollow steel cylinders split in the longitudinal direction, each pin being free to rotate in its seating and containing cylindrical shank means disposed within the pin with a predetermined clearance between the shank means and the pin to impose a limit on the reduction of the width of the split of the pin under the effect of an excessive couple.

4,329,857

COUPLER COVER

Carl E. Kittle, and James L. Price, both of Cedar Falls, Iowa, assignors to Deere & Company, Moline, Ill.

Filed May 16, 1980, Ser. No. 150,453
Int. Cl.³ F16D 3/84
U.S. Cl. 220—229 13 Claims

1. An improved coupler cover for preventing contaminants from contacting the end surface of a coupler, comprising:

(a) first and second diaphragms axially aligned adjacent to each other, each of said first and second diaphragms containing multiple slits extending outward from the center thereof, said multiple slits of said first diaphragm being angularly offset from said multiple slits of said second diaphragm; and

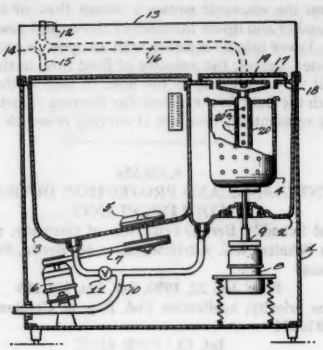
(b) retainer means secured to said first and second diaphragms for positioning said diaphragms relative to said end surface of said coupler.

4,329,858

AUTOMATIC DEHYDRATOR

Shizuo Okazaki, Aichi, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed May 27, 1980, Ser. No. 153,135
Claims priority, application Japan, Jul. 30, 1979, 54-96995
Int. Cl.³ D06F 29/00
U.S. Cl. 68—12 R 6 Claims



1. An automatic dehydrator comprising:

a basket for receiving clothes to be dehydrated;

a motor for rotating said basket;

supply means for supplying water into said basket;

timer means for controlling said motor and supply means to complete a dehydrating operation which includes a dehydrating rinse process for intermittently rotating said basket by intermittently energizing said motor while supplying water by said supply means and a dehydration process for continuously rotating said basket by continuously energizing said motor, said timer means including a plurality of timer switches and means for changing the condition of said switches to carry out said processes; and

a select switch serially connected in an electrical path for supplying electrical energy to said motor via at least one of said timer switches for selecting a combination of said dehydrating rinse process and said dehydration process when said select switch is in a first position or substantially said dehydrating rinse process alone when said select switch is in a second position.

4,329,859

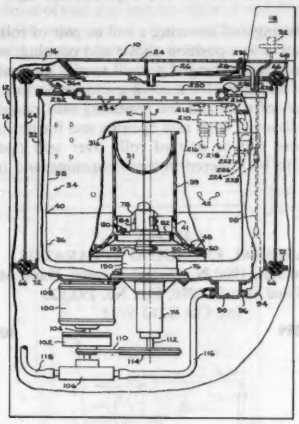
BASKET MOUNTING ARRANGEMENT FOR A WASHING MACHINE

Gerald L. Roberts, Louisville, Ky., assignor to General Electric Company, Louisville, Ky.

Filed Nov. 3, 1980, Ser. No. 203,208
Int. Cl.³ D06F 23/04
U.S. Cl. 68—23 R 13 Claims

1. A washing machine for fabric articles comprising: a generally upright basket having a central axis for receiving washing liquid and a fabric article load to be washed in the liquid; mounting means having a generally vertical reference axis connected to said basket to support and selectively drive said basket in a generally circulate path about the reference axis; driving means drivingly connected to said mounting means to move said basket in its generally circulate path during wash operations; and means for selectively preventing rotation of said basket about its central axis during wash operations; said mounting means being further constructed and arranged to provide a lateral offset of the central basket axis relative to the reference axis, the horizontal extent of the offset determining the radius of the circulate path, and to provide a cant of the central basket axis away from the reference axis such that a horizontal projection of the canted basket axis lags the direc-

tion of lateral offset by a predetermined lag angle relative to the direction of movement of said basket in its circulate path, whereby a component of vertical motion is imparted to fabric



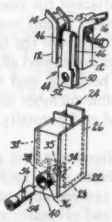
articles received in said basket during wash operations so as to enhance turnover and turn around of fabric articles received in said basket.

4,329,860

FRONT ENTRY ELECTRIC METER LOCKING ASSEMBLY

Sigurd M. Moberg, Etlan, Va., assignor to E. J. Brooks Company, Newark, N.J.

Filed Apr. 14, 1980, Ser. No. 139,776
Int. Cl.³ B65D *55/14;* F16L *21/06;* G01R *11/04*
U.S. Cl. 70—164 **5 Claims**



1. Locking means for retaining an electric meter in assembly with a meter mount, comprising a U-section split locking ring assembly including means on the ends of the locking ring to the contract the ring, a housing shielding the contracting means from access, a locking plate having an aperture disposed in the housing and fixed to the locking ring assembly, and a lock bolt extending through the housing and the opening in the locking plate with its axis perpendicular to the plane of the ring and preventing removal of the shielding means.

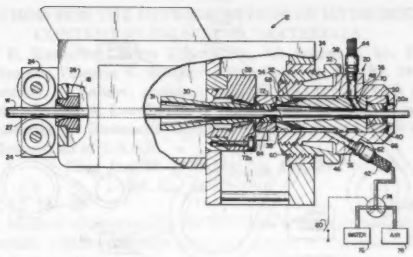
4,329,861

METHOD AND APPARATUS FOR DRAWING AND COOLING WIRE

Evan Griffiths, Newington, Conn., assignor to Orion Machinery and Engineering Corporation, Branford, Conn.

Filed Aug. 21, 1980, Ser No. 179,939
Int. Cl.³ B21C *1/00*
U.S. Cl. 72—14 **16 Claims**

1. In a dry lubricating wire drawing apparatus having means defining a lubricant receptacle for containing a quantity of dry lubricant, an axially extending die assembly including drawing die means having an entry in communication with the lubricant receptacle for receiving a wire axially therethrough after the wire has passed through the lubricant receptacle and reducing the cross sectional area of the wire as it is drawn through the drawing die means, means defining a cooling chamber in communication with an exit end of the drawing die means for



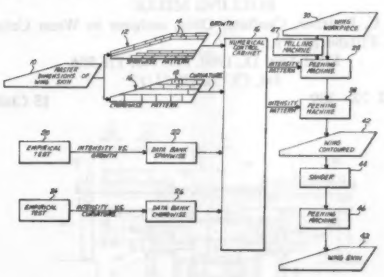
maintaining cooling liquid in direct contact with the exit end and with wire leaving the exit end, and means for circulating cooling liquid through the cooling chamber, the improvement comprising, sensing means for detecting a wire end portion approaching said entry end of said drawing die means, and means responsive to the sensing means for interrupting circulation of cooling liquid through the cooling chamber upon detection of an approaching wire end portion by said sensing means.

4,329,862

SHOT PEEN FORMING OF COMPOUND CONTOURS

Brian Harburn, Seattle, and John C. Miller, Des Moines, both of Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Jan. 21, 1980, Ser. No. 114,017
Int. Cl.³ B21J *5/00;* C21D *7/06*
U.S. Cl. 72—53 **8 Claims**



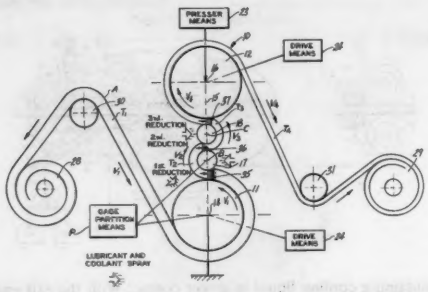
1. A method of imparting a compound contour to a sheet metal part, with the steps comprising: passing a sheet metal part through shot peening equipment, shot peening the part on both sides while varying the shot intensity in a pattern for localized growing imparting varying curvature, and shot peening the part on one side while varying the shot intensity in a pattern for imparting varying curvature in a second direction with the combination of shot peening permitting the part to conform to a compound contour.

4,329,863

COOPERATIVE ROLLING PROCESS AND APPARATUS

Michael J. Pryor, Woodbridge, and Joseph Winter, New Haven, both of Conn., assignors to Olin Corporation, New Haven, Conn.

Filed Jul. 9, 1980, Ser. No. 167,084
Int. Cl.³ B21B 1/22, 39/08
U.S. Cl. 72—205 33 Claims



1. A rolling mill comprising a plurality of rolls, said rolls defining a plurality of roll bites for reducing the thickness of a material being rolled, each of said roll bites defining a gap spacing between adjacent rolls;

means for driving a first and a second of said rolls at a desired peripheral speed ratio corresponding to a desired reduction in thickness of said material in a pass of said material through said mill;

at least one idling work roll arranged intermediate said first and second rolls;

means for providing a gap spacing which is fixed for at least one of said roll bites; and

means for providing a gap spacing which is not fixed for at least one other of said roll bites;

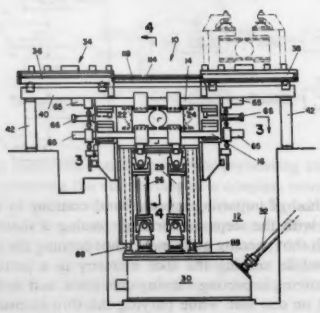
whereby it is possible to control in a desired manner the amount of thickness reduction of said material which occurs in at least one of said roll bites in a pass of said material through said mill.

4,329,864

APPARATUS FOR CHANGING ROLLS IN VERTICAL ROLLING MILLS

Harry C. Ledebur, Canfield, Ohio, assignor to Wean United, Inc., Pittsburgh, Pa.

Filed Aug. 11, 1980, Ser. No. 176,956
Int. Cl.³ B21B 31/12
U.S. Cl. 72—239 15 Claims



1. In a rolling mill or the like having a stand for receiving a pair of cooperative rolls arranged to rotate about parallel vertical axes,

a vertical opening in said stand for allowing one or both of said rolls to be moved and replaced through the top thereof,

means for raising and lowering a roll or pair of rolls in said stand relative to a position above said opening, and

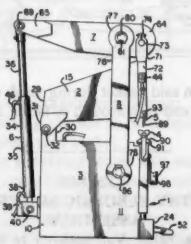
displaceable means arranged normal to said vertical axes at the top of said stand for receiving and supporting a raised roll or pair of rolls and for removing said raised roll or pair of rolls away from said opening and for positioning a replacement roll or pair of rolls over said opening in readiness to be lowered into said opening and into said stand.

4,329,865

MATERIAL ENGAGING APPARATUS

John W. Meinholdt, 1900 N. Central, Topeka, Kans. 66608

Filed Oct. 3, 1980, Ser. No. 193,823
Int. Cl.³ B21J 9/18
U.S. Cl. 72—389 10 Claims



1. A material engaging apparatus comprising:

(a) first and second jaw members with respective front and rear sides, said first jaw member being pivotally mounted to said second jaw adjacent the rear sides thereof;

(b) coordinating tool holder means mounted in said first and second jaw members adjacent the front sides thereof;

(c) an extensible member positioned along said rear sides and extending generally between said first and second jaw members; said extensible member having first and second ends with said second end pivotally mounted to said second jaw member;

(d) a lever arm spaced from said first jaw member and having front and rear ends with said front end pivotally mounted to said first jaw member adjacent said front side thereof and said rear end pivotally mounted to said extensible member first end; and

(e) a connecting link having first and second ends with said first end pivotally mounted to said lever arm between the front and rear ends thereof, said second end being pivotally mounted to said second jaw member whereby said connecting link comprises a fulcrum for said lever arm movable to provide substantially constant leverage to urge said first and second jaw members together.

4,329,866

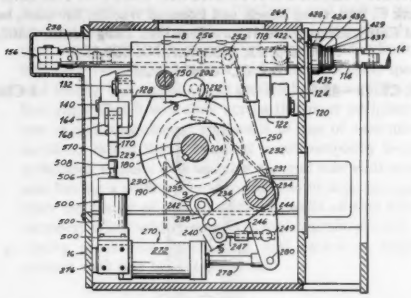
BEAM TRANSFER MECHANISM

Albert B. Babbitt, Bloomfield Township, Oakland County, Mich., assignor to Premier Forging Press Automation, Inc., Madison Heights, Mich.

Filed Jul. 10, 1980, Ser. No. 168,393
Int. Cl.³ B21D 43/05
U.S. Cl. 72—405 8 Claims

1. Transfer mechanism for moving workpieces step by step along a row of stations of a press, dies at each station for progressively forming a workpiece from a starting blank to a finished part as it is moved from station to station through the

press, each die comprising a lower die, a pair of laterally spaced beam transfer devices extending parallel to said row of stations, and cooperable to grip, release and transfer workpieces from station to station, one of said devices extending along the front of said dies and the other of said devices extending along the rear thereof, beam operating mechanism for moving said devices laterally toward and away from each other to grip and release the workpieces, for raising and lowering said devices after they have been moved laterally toward each other to raise workpieces gripped thereby from said



stations and lower the same to said stations, and for moving said devices longitudinally after they have been raised to advance each workpiece gripped thereby to the next station in the row, said front beam transfer device throughout the aforesaid raising and lowering and lateral and longitudinal movement thereof occupying positions obstructing the removal and replacement of said lower dies through the front of the press, and means for lifting said front beam transfer device far enough to permit the removal and replacement of said lower dies through the front of the press without obstruction.

4,329,867

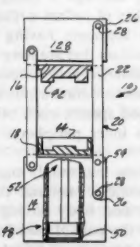
ARTICULATING FRAME PRESS

Richard E. Nelson, 53 E. Tacoma, Clawson, Mich. 48017

Filed Jun. 5, 1980, Ser. No. 156,642

Int. Cl.³ B21J *13/04*

U.S. Cl. 72—455 **11 Claims**



1. An articulating frame press for forming complementary parts including mold parts and metal stampings; the press including a first bolster plate and a second bolster plate; the bolster plates in a first position spaced apart in a parallel opposed manner; a fixed platen affixed to the first bolster plate and a movable platen associated with the second bolster plate; the frame comprising:

a first pair of spaced apart frame supports pivotally connected at their ends to the first and second bolster plates;

a second pair of spaced apart frame supports having a length less than the first pair of frame supports pivotally connected at their ends to the first and second bolster plates; and

means for rotating one of the first pair of frame supports relative to one of the bolster plates to pivotally displace the bolster plates from the first position to a second position wherein the bolster plates are in a non parallel, non opposed position.

4,329,868

METHOD FOR THE DETERMINATION OF HYDROGEN CONTENT IN INORGANIC MATERIALS

Lev B. Kuznetsov, ulitsa Pljuschikha, 42, korpus 1, kv. 47, Moscow; Valentin V. Strelkov, ulitsa Gorkogo, 164, kv. 194; Anatoly V. Zaitsev, pereulok Shkolny, 50, kv. 44, both of Izhevsk; Igor A. Lvov, ulitsa B. Gruzinskaya, 36-a, kv. 9, and Valentina P. Romanova, ulitsa Svobody, 3, kv. 44, both of Moscow, all of U.S.S.R.

Filed Jan. 18, 1980, Ser. No. 113,334

Int. Cl.³ G01N *7/16*

U.S. Cl. 73—19 **2 Claims**

1. Method of determining the hydrogen content in inorganic materials, which comprises melting a sample in a hermetically sealed electrode pulse furnace in a graphite crucible at a temperature within the range of from 1,600° to 2,500° C. in an inert atmosphere for a time sufficient for complete removal of hydrogen-containing compounds from the sample; and, while maintaining said temperature of from 1,600° to 2,500° C. in said furnace, unsealing said furnace and delivering the hydrogen evolved upon melting to the site of its quantitative recording by means of an inert gas at said temperature of from 1,600° to 2,500° C., whereby substantially complete reduction of the hydrogen-containing compounds from said sample is obtained and the hydrogen content of said sample is determined with a high degree of accuracy.

4,329,869

APPARATUS FOR MEASURING THE AMOUNT OF AIR BUBBLES CONTAINED IN LIQUID

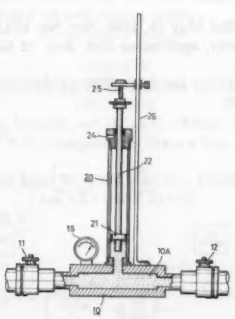
Kenichi Toda, Anjyo, Japan, assignor to Kabushiki Kaisha Polyurethan Engineering, Tokyo, Japan

Filed May 15, 1980, Ser. No. 150,099

Claims priority, application Japan, Jul. 27, 1979, 54-96612

Int. Cl.³ G01N *7/00*

U.S. Cl. 73—19 **2 Claims**



1. An apparatus for measuring the amount of air bubbles contained in an incompressible liquid, said apparatus comprising:

(a) a first chamber means having valves at each end thereof for receiving the liquid to be measured;

(b) cylinder means connected to said first chamber means, said cylinder means including a piston movable therein and a second chamber defined by said piston and the walls of said cylinder means, said second chamber being contiguous with and opening into said first chamber means,

wherein the movement of said piston varies the volume of said second chamber;

(c) adjustable stop means operatively coupled to said piston for limiting the movement of said piston to predetermined set positions; and

(d) pressure gauge means coupled to said first chamber means for measuring the pressure therein.

4,329,870

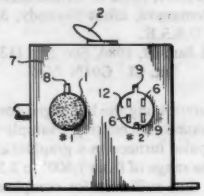
METHANE MONITOR SENSING SYSTEM

D. Eugene Farmer, P.O. Box 542, Mt. Gay, W. Va. 25637

Filed May 31, 1979, Ser. No. 44,231

Int. Cl.[3] G01N *27/12*

U.S. Cl. 73—23 2 Claims



1. A monitor for the analysis of methane comprising at least one removable and replaceable methane sensor adapted to be inserted interchangeably into at least one receptacle located on the outside wall of the said monitor by plugs attached to said sensor, which enables said sensor to be connected to a circuit means having a switch means for connecting one of the said sensors at a time to the said circuit means that illuminates a designated bulb attached on the monitor when the said sensor is correctly operating, and with a thumb operated latch attached to said sensor for latching said sensor into any of the said receptacles.

4,329,871

UNDESIRABLE COMBUSTION CHARACTERISTIC DETECTION APPARATUS

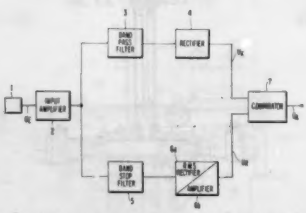
Horst Grossner, Bergien; Ingo Dudeck, Weinstadt, and Manfred Maass, Esslingen, all of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

Filed May 21, 1980, Ser. No. 151,990

Claims priority, application Fed. Rep. of Germany, Jun. 7, 1979, 2923056

Int. Cl.[3] G01L *23/22*

U.S. Cl. 73—35 6 Claims



1. Device for recognizing undesired combustion processes in internal combustion engines with conventional ignition systems by means of an acceleration sensor, a band-pass filter tuned to the frequency of the knocking vibrations, rectifiers located in the signal path of the knocking signal and of a reference signal path, and a comparator, whose output signal is assigned to the undesired combustion processes to be recognized, characterized by the fact that the band-pass filter is disposed with one rectifier in the signal path of the knocking signal and by the fact that in the signal path of the reference signal, there is a series circuit composed of a band elimination filter means tuned to the knocking frequency, a rectifier, and an amplifier, whereby the rectifier is an RMS rectifier and whereby the body noise signal is converted into the reference signal by the series circuit when it is received from the acceleration sensor.

4,329,872

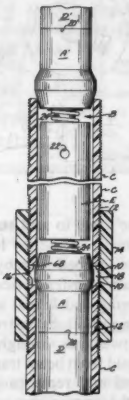
HIGH PRESSURE HYDRAULIC TESTING PACKER

Frank C. Ball, Long Beach, and Edmund Wardle, Burbank, both of Calif., assignors to Hydro-Test Inc., Long Beach, Calif.

Filed Sep. 22, 1980, Ser. No. 189,181

Int. Cl.[3] G01M *3/28*

U.S. Cl. 73—49.5 1 Claim



1. In combination with a hydraulic testing unit of the type that includes a pair of longitudinally spaced mandrels that have flat adjacent end surfaces from which rods extend towards one another and being joined by pressurized water conducting means, a pair of resilient packers mounted in longitudinal spaced relationship on said testing unit to permit the latter to be moved longitudinally through a string of tubular members connected by a plurality of collars without becoming hung up therein, said tubular members having flat ring-shaped end surfaces within said collars that are longitudinally spaced from one another a first distance and cooperate with the interior surfaces of said collars to define a plurality of outwardly extending annulus shaped spaces, each of said ring-shaped end surfaces including an inner periphery, each of said packers including:

a. a rigid metallic tube that snugly engages one of said rods;

b. a body of elastomeric material that includes first and second portions, said body having said tube embedded longitudinally in the part of said first portion most adjacent said second portion; said first portion defined by a first ring-shaped end surface, said first end surface having inner and outer peripheries, a first external cylindrical side wall of a diameter substantially smaller than the interior diameter of said tubular members that extends from said outer periphery towards said second portion, a longitudinal bore in said first portion that extends from said inner periphery to communicate with said tube and through which bore one of said rods extends; said second portion of generally cup-shape and defined by a second cylindrical side wall that has first and second peripheries, a first outwardly tapering side wall section that extends from said first periphery, a second inwardly tapering side wall

section that extends longitudinally from said second periphery to terminate in a flat ring-shaped end surface that has inner and outer peripheries, a conical interior side wall that extends longitudinally from said inner periphery of said second end wall to a position adjacent said tube, said second cylindrical side wall of a diameter greater than the interior diameter of said tubular members and said elastomeric material inwardly therefrom being compressed as a result thereof when said packer is in one of said tubular members, said outer periphery of said second end wall substantially smaller than the interior diameter of said tubular members, said second tapered side wall section having a sufficiently great width that as said packer moves towards one of said annulus spaces said second end will traverses said first distance prior to said second cylindrical side wall moving into one of said annulus shaped spaces, said second tapered side wall section having a sufficiently low angle that it will slide across the inner periphery of one of said ring-shaped end walls of one of said tubular members rather than have said inner periphery become embedded therein, and said first tapered side wall section also having a sufficiently low angle as to slide across the inner periphery of one of said end walls of said tubular members when said packer is moved thereover; and

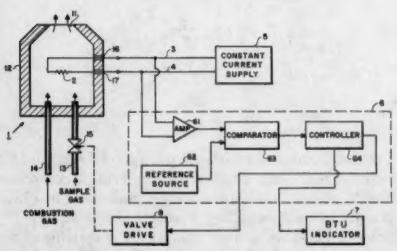
c. spring means for maintaining said packer in abutting contact with one of said mandrels.

4,329,873

CALORIMETRIC APPARATUS

Shosaku Maeda, Atsugi, Japan, assignor to Honeywell Inc., Minneapolis, Minn.

Filed Nov. 19, 1980, Ser. No. 208,135
Claims priority, application Japan, Jul. 4, 1980, 55-45852
Int. Cl.[3] G01N *25/30, 17/00*
U.S. Cl. 73—190 CV **7 Claims**



1. A calorimetric apparatus comprising:

a reactor having a first passage for introducing a sample gas thereinto and a second passage for introducing combustion gas thereinto,

a control valve provided in said sample introducing first passage,

an oxidation catalyzing element disposed in said reactor, and adapted to be heated to a sample gas oxidation catalyzing temperature below the ignition point of the said sample gas so that said sample gas may generate heat by catalytic oxidation when brought into contact with said heating element to increase the temperature of said element,

a control system for detecting a change in the resistance of said heating element which is caused by said heat produced by the catalytic oxidation, and for transmitting a control signal corresponding to said change to actuate said control valve to maintain said temperature of said heating element at a predetermined constant level,

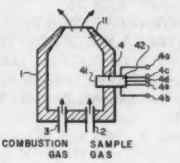
a display means connected to said control system for indicating the calorific value of said sample gas in response to said control signal.

4,329,874

CALORIMETRIC APPARATUS

Shosaku Maeda, Atsugi, Japan, assignor to Honeywell Inc., Minneapolis, Minn.

Filed Nov. 19, 1980, Ser. No. 208,136
Claims priority, application Japan, Jul. 4, 1980, 55-45857
Int. Cl.[3] G01K *17/00*; G01N *25/30*
U.S. Cl. 73—190 CV **10 Claims**



1. A calorimetric apparatus comprising:

a reactor having a passage means for introducing sample and combustion gases thereinto,

a thermoelement having a first portion disposed inside said reactor and a second portion disposed outside said reactor, one of said first and second portions being adapted to absorb heat, while the other of said portions is adapted to emit heat, when said thermoelement is supplied with an electric current,

an oxidation catalyzing element provided on said first portion of said thermoelement,

a first temperature sensor element provided on said first portion of said thermoelement,

a second temperature sensor element provided on said second portion of said thermoelement,

a power source unit for supplying the electric current to said thermoelement,

a control system means connected to said first and second sensor element and said power source unit for producing an output control signal representative to a difference in temperature between said first and second portions for controlling the electric current supplied by said power source unit, and

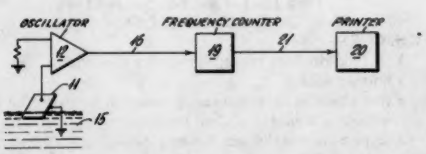
display means connected to said control system and responsive to a display control signal corresponding to said output signal, whereby the calorific value of said sample gas is displayed on said display means.

4,329,875

ULTRA SENSITIVE LIQUID LEVEL DETECTOR AND METHOD

Jerry L. Nolting, Fishkill, and Ralph C. Muller, Hopewell Junction, both of N.Y., assignors to Texaco Inc., White Plains, N.Y.

Filed Mar. 31, 1980, Ser. No. 135,407
Int. Cl.[3] G01F *23/22*
U.S. Cl. 73—290 V **12 Claims**



1. Ultra sensitive liquid level detector, comprising in combination

a piezoelectric transducer partially immersed in said liquid,

a variable frequency oscillator having said transducer associated therewith to control the frequency of oscillation in

accordance with the vibrating mass of the non-immersed portion of said transducer, and

frequency counter means for monitoring said oscillation frequency to determine the level of said liquid relative to said transducer.

4,329,876

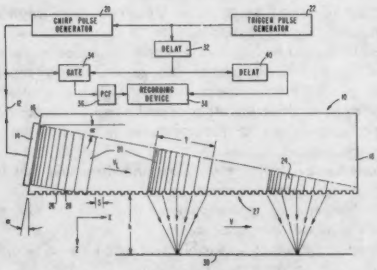
METHOD AND APPARATUS FOR ACOUSTIC SCANNING USING BULK WAVE SCATTERING OF BULK WAVES BY AN ACOUSTIC GRATING

Wen-Hsien Chen, Ta-hsi, Taiwan, and Eric G. Lean, Chappaqua, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 3, 1980, Ser. No. 156,226

Int. Cl.³ G01N *29/04*

U.S. Cl. 73—618 **31 Claims**



1. An acoustic beam scanner, comprising:

an acoustic bulk wave propagation medium;

means for generating a chirp pulse;

transducer means responsive to said chirp pulse for converting said chirp pulse into an acoustic bulk wave chirp pulse propagating through said propagation medium; and

an acoustic grating structure positioned along the propagation path of the acoustic bulk wave chirp pulse such that the acoustic bulk wave chirp pulse intersects the acoustic grating at grazing incidence, the bulk acoustic wave chirp pulse being scattered by the acoustic grating into a focused beam of acoustic bulk waves, the focused beam scanning in a direction parallel with the acoustic grating.

4,329,877

ADJUSTABLE OVERLOAD MECHANISM FOR A DIFFERENTIAL PRESSURE TRANSMITTER

George E. Hershey, Ardsley, Pa., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Jul. 1, 1980, Ser. No. 165,116

Int. Cl.³ G01L *7/08*

U.S. Cl. 73—706 **18 Claims**

1. A fluid pressure responsive device comprising

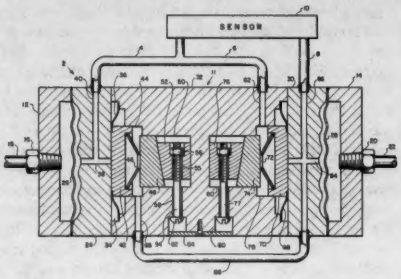
a housing means,

a first chamber in said housing means arranged to be connected to a source of fluid pressure,

a second chamber in said housing means,

a movable diaphragm in said housing means separating said first and second chambers, and

adjustable means in said second chamber for biasing said diaphragm to minimize the volume in said first chamber, wherein said adjustable means includes a spring means in contact with said diaphragm, a fixed wall attached to said housing means and an adjustable separator means between said wall and said spring means for selectively establishing



the spacing of said spring means from said wall, wherein said spring means includes a Belleville washer.

4,329,878

BRIDGE CIRCUIT FORMED OF TWO OR MORE RESISTANCE STRAIN GAUGES

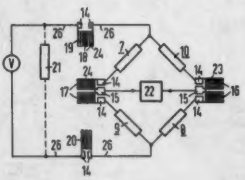
Ferdinand Utner, and Harald Vetter, both of Regensburg, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Apr. 18, 1980, Ser. No. 141,624

Claims priority, application Fed. Rep. of Germany, Apr. 23, 1979, 2916390

Int. Cl.³ G01B *7/20*; G01L *1/22*

U.S. Cl. 73—766 **2 Claims**



1. A bridge circuit for resistance measurement in which the bridge circuit represents a full measuring bridge, comprising:

a plurality of resistance strain gauges connected in a bridge arrangement and including a pair of bridge taps;

said resistance strain gauges comprising a metallized resistance layer for all of said resistance strain gauges forming bridge resistors and a common synthetic layer carrying said resistance layers;

each of said resistance strain gauges comprising contact surfaces of solderable material directly bonded to said resistance layer;

a plurality of balance surfaces connected to said resistance layer;

first ones of said balance surfaces being connected in series with each of the relevant bridge resistors adjacent said taps;

current supply lines connected to said bridge circuit at respective portions of said resistance layer; at least two contact surfaces on at least one of said supply lines connected to one another via said balance surfaces;

each of said balance surfaces comprising a ladder structure including rungs and openings, and wherein said rungs can be cut and said openings can be soldered for the purpose of balancing;

an operational amplifier connected to said taps;

one resistor of one portion of the resistance strain gauges being connected in parallel to the external current supply lines;

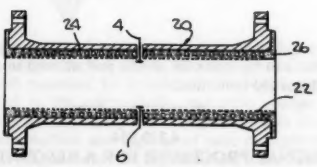
said resistance layer comprising chromium/nickel;
said contact surfaces comprising copper;
said balance surfaces including first balance surfaces connected in series with one bridge branch and comprising chromium/nickel, and including second balance surfaces connected in series with another bridge branch and comprising additional copper;
a tap in each bridge branch connected to a contact surface between two balance surfaces;
each of said balance surfaces electrically connected to at least one bridge resistor;
said bridge circuit adapted, as to symmetry, to the bridge resistors and to the temperature coefficients of the circuit resistors and a test object; and
the measuring range being set by said balance resistors.

4,329,879

INSULATING LINER FOR ELECTROMAGNETIC FLOWMETER TUBE

Eggert Appel, Dransfeld; Wilfried Kiene, Hann-Muenden, and Dieter Meier, Goettingen, all of Fed. Rep. of Germany, assignors to Fischer & Porter Co., Warminster, Pa.

Filed Jul. 14, 1980, Ser. No. 168,147
Int. Cl.³ G01F *1/58*
U.S. Cl. 73—861.12 **4 Claims**



1. An electromagnetic flowmeter comprising:
A. a metal flow tube provided with a pair of diametrically opposed electrodes whereby when a fluid to be metered is conducted through the tube, it intersects a magnetic field to induce a voltage in the fluid which is transferred to the electrodes; and
B. a protective liner assembly installed within said meter tube, said assembly being constituted by a three-dimensional stiffening structure embedded within a layer of insulating material which conforms to the inside surface of the flow tube, said stiffening structure being formed by a metal wire mesh bonded at discrete points to the inside surface of said tube, said insulating material being molded about the mesh whereby the liner is inseparable from the tube.

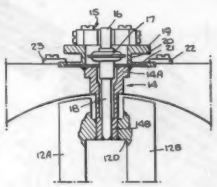
4,329,880

VORTEX-SHEDDING FLOWMETER WITH TORSIONAL SENSOR MOUNTED ON TORQUE TUBE

Peter J. Herzl, Morrisville, Pa., assignor to Fischer & Porter Co., Warminster, Pa.

Continuation-in-part of Ser. No. 37,532, May 10, 1979, Pat. No. 4,262,544, which is a continuation-in-part of Ser. No. 13,557, Feb. 21, 1979, Pat. No. 4,226,117, which is a continuation-in-part of Ser. No. 944,624, Sep. 21, 1978, Pat. No. 4,181,020. This application Aug. 14, 1980, Ser. No. 178,176
Int. Cl.³ G01F *1/32*
U.S. Cl. 73—861.24 **9 Claims**

1. A vortex-shedding flowmeter capable of accurately measuring the flow rate of a fluid even under extreme conditions of temperature, the flowmeter comprising:
A. a flow pipe through which the fluid to be metered is conducted along a flow axis;
B. a shedder mounted in said pipe to intercept said fluid, vortices being detached from said shedder;
C. a sensor torsionally supported in said flow pipe along a pivot axis at right angles to the flow axis whereby said sensor is caused by said vortices to oscillate about said pivot axis at a rate proportional to flow, the support therefor including a torque tube whose base is received within a bore in said flow pipe and is joined thereto and whose tip is joined to one end of said sensor to exclude said fluid from the interior of said tube;
D. a transducer external to said pipe to convert the sensor oscillations into corresponding electrical signals; and



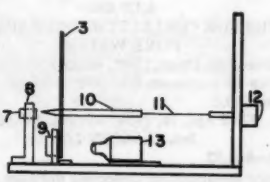
E. a sensor link assembly coupling said sensor to said transducer and including a main rod extending into the interior of said torque tube and joined at one end to the tip thereof, the other end of said main rod being connected through a diaphragm coupler to an extension rod which is connected to said transducer, whereby the motion of the tube is transmitted via the rod to said transducer, said diaphragm coupler attenuating the transmission of bending forces imposed on said torque tube.

4,329,881

EXTREMELY SENSITIVE FORCE DETECTOR

Alden Schloss, P.O. Box 4862, North Hollywood, Calif. 91607

Filed Feb. 22, 1980, Ser. No. 123,845
Int. Cl.³ G01L *1/04, 3/00*
U.S. Cl. 73—862.08 **5 Claims**



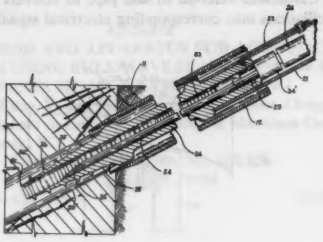
1. An extremely sensitive force detector; comprising in combination a source of energy directed at a suitable detector for providing electrical output signals responsive to the received energy; a freely moveable input member shaped and positioned to partially obstruct said energy on its way to the detector; the position of the input member determining the degree of obstruction of said energy; a shaft carrying the input member is supported at its first end by a force field; attached to the opposite end of said shaft is a flexible means for the purpose of restraining the shaft in the force field; the opposite end of said flexible means is attached to a frame which supports all elements in this assemblage; a window is provided in the frame for the purpose of observing the input member; an amplifier is connected to the detector to increase the strength of the electrical signals provided by said detector; and said amplifier drives an output indicator for the purpose of ascertaining the degree of motion of the input member.

4,329,882

UTILITY POLE INSPECTION KIT

Edgar L. Kaup, 2200 S. Raritan St., Englewood, Colo. 80110

Filed Feb. 22, 1980, Ser. No. 123,514
Int. Cl.³ G01N *1/08*
U.S. Cl. 73—864.44 **13 Claims**



12. The method for sampling the condition of a wooden body below the surface of the ground which comprises:

providing a straight metal tube long enough to extend through the ground to the wooden body,

providing a rod having a length sufficient to reach through the tube and having a pointed end adapted to extend beyond the tube,

placing a rod in the tube with its end extending from the end of the tube driving the tube and the rod together through the ground and against the body,

removing the rod while leaving the tube with its end in place in the body,

providing a sampling drill and utilizing the indentation made by the point of the rod as a starting hole for the drill and operating the drill for obtaining a sample of the wood of the body, and

withdrawing the sample through the tube.

4,329,883

APPARATUS FOR COLLECTING DEEP-SEA SEDIMENT PORE WATER

Ross O. Barnes, San Diego, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 26, 1974, Ser. No. 464,604
Int. Cl.³ G01N *1/14*
U.S. Cl. 73—864.52 **12 Claims**

1. Collector apparatus for collecting deep-sea sediment pore water comprising:

an elongate casing adapted to descend through said sea water into a stable position within said sediment, said casing being provided with a pore water sample-collecting chamber,

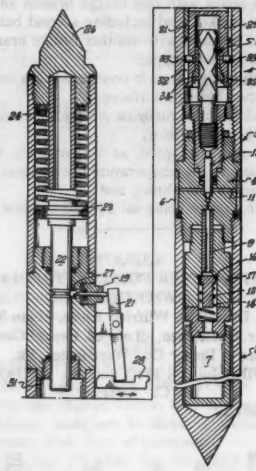
said casing further being formed with a passage for communicating the casing interior with said sediment pore water and with an inlet conduit communicating said chamber with said passage,

normally-closed resiliently-yieldable valve means disposed in said inlet conduit,

control means normally blocking said communications between said passage and said inlet conduit, and

means for activating said control means, said activation opening said communication for exposing said resilient valve means to the hydrostatic pressure of said deep-sea environment,

the resilient force of said valve means being such that said valve means yieldably opens with so exposed and closes when the filling of said chamber causes its interior pressure to reach a predetermined level whereby said pore water can be collected in-situ and utilized in a relatively undisturbed condition.

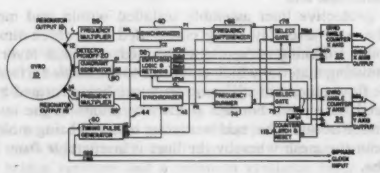


4,329,884

SIGNAL PROCESSOR FOR A RESONATOR RESTRAINED GYRO

Lincoln S. Ferriss, Lincoln Park, N.J., assignor to The Singer Company, Little Falls, N.J.

Filed Oct. 14, 1980, Ser. No. 196,495
Int. Cl.³ G01C *19/28*
U.S. Cl. 74—5.6 D **10 Claims**



1. A signal processor for a gyro equipped with at least two force responsive resonators, respectively generating signals of first and second frequencies during gyro operation, and wherein the gyro further includes means for detecting rotation of a gyro rotor through four quadrants, the processor comprising:

means for generating signals indicative of rotation through each respective quadrant;

means for adding the frequencies of the first and second frequency signals;

means for subtracting the frequencies of the first and second frequency signals;

switching means connecting at the input thereof to the output of the signal generating means for producing control signals corresponding to gyro rotor rotation through the four quadrants;

gating means controlled by the control signals and having the added frequency signals and the subtracted frequency signals present at inputs thereof;

a first counter controlled by the control signals and having an input connected to an output of the gating means for

counting to a value proportional to gyro angular input about a first axis; and

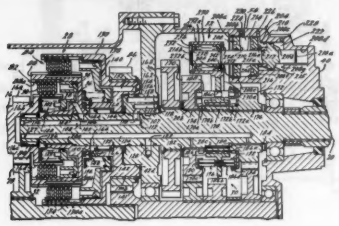
a second counter controlled by the control signals and having an input connected to an output of the gating means for counting to a value proportional to gyro angular input about a second axis.

4,329,885

POWERSHIFT SYNCHRONIZED TRANSMISSION

Timothy J. Morscheck, Lathrup Village, Mich., assignor to Eaton Corporation, Cleveland, Ohio

Filed Dec. 26, 1978, Ser. No. 973,271
Int. Cl.³ F16H *3/38, 3/08*
U.S. Cl. 74—339 **10 Claims**



1. In a transmission of the type including a housing; an input shaft and an output shaft mounted for rotation in the housing; a countershaft mounted for rotation in the housing and disposed parallel to the other shafts; and ratio change means connectable between said input and output shafts to provide at least low, intermediate and high speed ratio changes between the input and output shafts; the improvement wherein the ratio change means comprises:

low and intermediate speed ratio gears mounted for rotation about one of said shafts and operative when coupled to said one shaft to provide said low and intermediate speed ratios between said input and output shafts via said countershaft;

first and second jaw clutch members operative when engaged to couple said intermediate gear to said one shaft, said members normally rotating at different speeds during transmission upshifting and downshifting into said intermediate gear;

a first friction clutch operative when engaged to frictionally interconnect said input and output shafts, said first friction clutch fully engageable to couple said low speed ratio gear directly to said one shaft and momentarily engageable during downshifting into said intermediate speed ratio to momentarily connect said low speed ratio gear directly to said one shaft to synchronize said members for engagement; and

a second friction clutch operative when engaged to frictionally interconnect said input and output shafts, said second friction clutch fully engageable to couple said input shaft directly to said output shaft to provide said high speed ratio and momentarily engageable during upshifting into said intermediate speed ratio to momentarily connect said input shaft directly to said output shaft to synchronize said members for engagement, and said first and second friction clutches being disengaged when said input and output shafts are interconnected by said intermediate speed ratio.

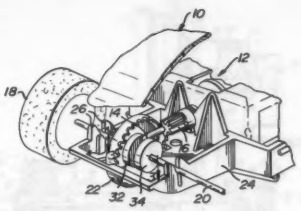
4,329,886

POSITIVE MESH GEARING SYSTEM FOR TOY CARS

Richard L. Branstner, Costa Mesa, Calif., assignor to Tyco Industries, Inc., Moorestown, N.J.

Filed May 1, 1980, Ser. No. 145,559
Int. Cl.³ F16H *1/12*
U.S. Cl. 74—416 **5 Claims**

1. In a gear system for use in a toy vehicle, wherein a first drive gear is mounted on a drive shaft which transmits motive power to a driven wheeled axle and wherein a second driven gear is mounted on the wheeled axle, the wheeled axle being subject to lateral displacement with respect to the drive shaft, the drive shaft being substantially perpendicular to the axle, and the first and second gears being in mesh to couple power from the drive shaft to the driven wheeled axle, the improvement comprising drive shaft extension means coupled to said first drive gear, said drive shaft extension means extending in a direction substantially perpendicular to the driven wheeled



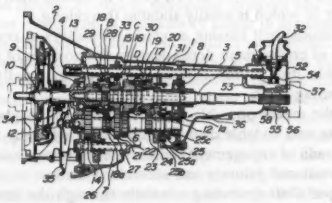
axle, and constraint means including at least two elements mounted on the driven wheeled axle and spaced apart to receive between them said drive shaft extension means whereby lateral displacement of the driven wheeled axle with respect to the drive shaft is constrained in two directions by contact between either of said elements and the drive shaft extension means.

4,329,887

TRANSMISSION FOR AN AUTOMOBILE

Tamio Kawamoto, Sagamihara, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Feb. 5, 1980, Ser. No. 118,730
Claims priority, application Japan, Feb. 7, 1979, 54-13510
Int. Cl.³ F16H *57/04;* F16N *7/26*
U.S. Cl. 74—467 **1 Claim**



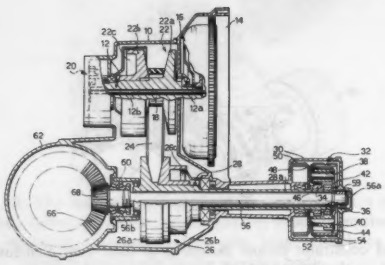
1. In an automotive transmission wherein speed changes are effected by axially and rotationally adjusting a control shaft extending through a gear case, the improvement therein comprising: a lubricating oil reservoir surrounding the control shaft, a shelf in said gear case inclined toward said reservoir, said shelf being arranged to collect and deliver oil to said reservoir, an internal passageway extending axially through the control shaft, an inlet opening in the control shaft through which oil is received from said reservoir into said internal passageway, and outlets in the control shaft communicating with said internal passageway and through which oil is delivered at locations remote from said reservoir, the gear case having bearings journaling gears for different speeds and a case extension with a bush, the control shaft having one said outlet facing said case extension bush adapted to provide the lubricating oil from said internal passageway to said case extension bush, said one outlet for providing oil to said case extension bush being located at one end of the control shaft.

4,329,888

DRIVE TRANSMISSION UNIT INCORPORATING EXPANSIBLE-PULLEY STEPLESS SPEED CHANGER

Gianluigi Falzoni, Turin, Italy, assignor to Fiat Auto S.p.A., Turin, Italy

Filed Feb. 28, 1980, Ser. No. 125,387
Claims priority, application Italy, Apr. 11, 1979, 67765 A/79
Int. Cl.[3] F16H *37/00, 37/08, 57/10*
U.S. Cl. 74—689 4 Claims



1. In a motor vehicle, a drive transmission unit adapted to be operatively interposed between the vehicle's engine and the half shafts of the vehicle's driving wheels, said unit incorporating an expansible-pulley stepless speed changer and comprising:

a support structure,

a primary shaft rotatably mounted in said support structure and connectable at one end to the drive shaft from the engine of said vehicle, a hollow secondary shaft rotatably mounted in said support structure parallel to said primary shaft,

two expansible pulleys respectively mounted fast for rotation on said primary and secondary shafts, each pulley comprising two facing frusto-conical discs one of which is rigidly connected to its respective mounting shaft and the other of which is axially slidable therealong,

a trapezoidal belt passing around said pulleys at respective radii of engagement dependent on the position of the said slidable disc of the corresponding pulley axially of its mounting shaft,

hydraulic means operable to control the axial displacement of the said slidable disc of each pulley whereby to vary said radii of engagement and change the transmission ratio between said primary and secondary shafts,

an output shaft extending coaxially through the interior of said hollow secondary shaft and projecting from both ends thereof,

an epicyclic reversing unit coaxial with said secondary shaft and driven from one end thereof, the said reversing unit providing a reduction gear stage for the transmission unit and having a rotatable output member connected to one end of said output shaft, the reversing unit being remotely selectively settable into one of three operating states in the first of which said output shaft is arranged to rotate in the same sense as said secondary shaft, in the second of which said output shaft is arranged to rotate in the opposite sense to said secondary shaft, and in the third of which said output shaft is drivingly disengaged from said secondary shaft,

a differential unit carried by said support structure adapted to be drivingly connected to the said half shafts, and

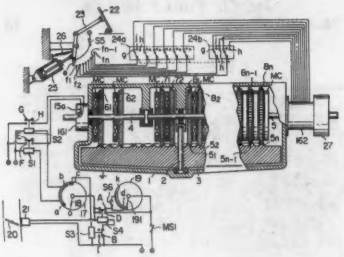
a bevel-gear reduction stage arranged to transmit drive from the end of the output shaft remote from the reversing unit to the differential unit.

4,329,889

POWER TRANSMISSION MECHANISM FOR HYBRID TYPE FLY-WHEEL DEVICE

Takeo Hachiya, 1956, Ooaza-Nakano, Oora-Gun, Oora-Machi, Gunma, 370-06, Japan

PCT No. PCT/JP79/00095, § 371 Date Jan. 25, 1980, § 102(e) Date Jan. 14, 1980, PCT Pub. No. WO79/01115, PCT Pub. Date Dec. 13, 1979
PCT Filed Apr. 16, 1979, Ser. No. 190,761
Claims priority, application Japan, May 25, 1978, 53/61670
Int. Cl.[3] B60K *41/06;* G05G *1/00*
U.S. Cl. 74—858 4 Claims



1. A power transmission mechanism for a hybrid type fly-wheel vehicle, comprising in combination:

(a) a casing;

(b) a drive shaft connected to an internal combustion engine, and supported in one part of said casing;

(c) at least one fly-wheel rotatably supported on a shaft which is disposed perpendicularly to said drive shaft;

(d) a propeller shaft held in said casing in alignment with said drive shaft and which receives driving power from said fly-wheel;

(e) a plurality of ring gears formed concentrically and circumferentially on the surface of said fly-wheel;

(f) drive gears rotatably supported on the drive shaft;

(g) reverse gears and driven gears rotatably supported on said propeller shaft, said driven gears being separated from, and confronting to, said reverse gears with said fly-wheel supporting shaft as a separating point;

(h) an electromagnetic clutch mechanism coaxially provided on each of said drive gears, reverse gears, and driven gears, said clutch mechanism functioning to connect and disconnect each said gear in accordance with numbers of revolution of the internal combustion engine;

(i) a first control mechanism which disconnects said electromagnetic clutch mechanism, and closes a throttle valve by detecting increase in the numbers of revolution of the internal combustion engine to a predetermined value; and

(j) a second control mechanism which opens said throttle valve, and connects said electromagnetic mechanism again by detecting decrease in the numbers of revolution of said fly-wheel to a predetermined value.

4,329,890

DEVICE FOR SETTING PRECIOUS STONES

Frederik Ferstenberg, 8, Baillet-Latourlei, 2130 Brasschaat, Belgium

Filed Jun. 18, 1980, Ser. No. 160,624
Claims priority, application Belgium, Jun. 21, 1979, 57892; Jun. 13, 1980, 58602
Int. Cl.[3] B23P *5/00*
U.S. Cl. 81—7 13 Claims

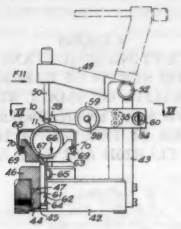
1. Device for setting precious stones in bezels with claws mounted on rings or the like, said device including:

a receptacle means;

a support for said ring or the like, said support being at least partially engageable in said receptacle means;

a means for maintaining in position a stone placed in said bezel; and

a setting means for setting said claws of said bezel after a stone has been placed therein, said setting means including



two angularly displaceable levers mounted on a standard and carrying at one end a setting jaw, control means being provided to move said jaws towards and away from each other.

4,329,891

WIRE STRIPPING TOOLS

Zdzislaw Bieganski, Timber La., Bedfordshire MK17 9PL, England

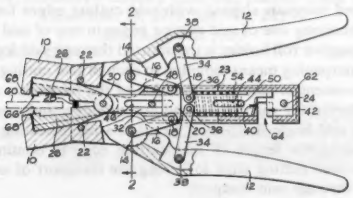
PCT No. PCT/GB79/00121, § 371 Date Mar. 27, 1980, § 102(e) Date Mar. 13, 1980, PCT Pub. No. WO80/00392, PCT Pub. Date Mar. 6, 1980

PCT Filed Jul. 18, 1979, Ser. No. 190,855

Claims priority, application United Kingdom, Jul. 27, 1978, 31420/78

Int. Cl.³ H02G *1/12*

U.S. Cl. 81—9.5 A **3 Claims**



1. A wire stripping tool comprising a pair of outer jaws (**10**) for gripping a cable, a pair of inner jaws (**26**) for cutting the sheath of the cable, a lever handle (**12**) for closing the jaws, a drawbar (**32**) for displacing the inner jaws relative to the outer jaws, and at least one link (**34**) connecting the lever handle to the drawbar for actuating the drawbar, at least one outer jaw being pivoted (on pin **22**) to a common member (**23**), characterized in that the last mentioned outer jaw is also pivoted directly (on pin **14**) to the lever handle, for closing of the outer jaws by the lever handle, and a spring (**54**) is arranged to act linearly against said drawbar to prevent premature displacement of the inner jaws relative to the outer jaws, a further link (**16**) being connected at one end to the pivotal connection between the jaw and the lever handle and at the other end to a cursor (**20**) arranged so that initial closing movement of the pivoted handle displaces the cursor toward the jaws and increases the distance of the pivotal connection of the lever handle and jaw from the drawbar.

4,329,892

SHOCK-SOCKET

Vincent J. Daigle, 115 Sickle St., Chatham, New Brunswick, Canada (E1N 2B9)

Filed Sep. 8, 1980, Ser. No. 184,899

Int. Cl.³ B25B *17/00*

U.S. Cl. 81—55 **1 Claim**

1. A mechanical combination consisting of a solid handle combined in the center thereof with a truncated tail by weld means, to form a truncated T-shaped unit, the truncated tail being provided with a squared aperture in the end thereof and being further provided with a threaded aperture in one side thereof, the said aperture being adapted and designed to receive and hold a conventional set-screw, the handle is combined by set-screw means with a unitary solid round member, one end of which is squared to fit into the squared aperture in the tail of the handle and the other end of which is rounded and relatively larger in diameter than the body of the above described round member, the said rounded end being oblongularly hollowed in the interior thereof, the hollowed interior having rounded corners in order to fit over the stem of a conventional shock-absorber, the said round member is provided with two circular indented scores, these scores are each disposed and adapted to receive a conventional snap-ring, the said round member is disposed and adapted to be placed inside a unitary hollow round cylindrical member and to be held in a movable position therein by the said snap rings on the round member, the said unitary hollow round cylindrical member has one end thereof exteriorly hexagonal in shape and the interior diameter of this end is fractionally larger in diameter than the exterior diameter of the round member and permits the round member to move freely upward and downward therein for a distance controlled by distance between the said snap-rings on the round member, immediately under the exteriorly hexagonal section of the cylindrical member there is another section of the cylindrical member, relatively larger in exterior diameter than the hexagonal section, the cylindrical member has at its bottom end a section which is relatively smaller in its exterior and interior diameters than the body of the cylindrical member, this latter section of the cylindrical member is interiorly provided with ridges disposed and adapted to form a hexagonal section in the interior thereof, the hexagonal section is disposed and adapted to receive and hold the nut on the stem of a conventional shock-absorber.

4,329,893

DEVICE AND METHOD FOR HANDLING TRIM STRIP IN A WEB SLITTER

George H. Wong, Roscoe, Ill., assignor to Beloit Corporation, Beloit, Wis.

Filed Jun. 19, 1980, Ser. No. 161,133

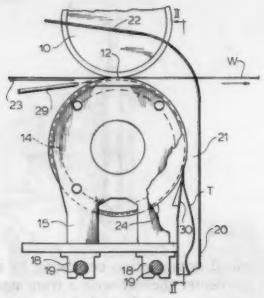
Int. Cl.³ B26D *1/24;* B65H *35/02*

U.S. Cl. 83—24 **14 Claims**

14. A method of handling trim strip in a high speed web slitter having upper and lower rotary slitting means cooperating at a severance point for trimming a strip from the edge portion of a travelling web, and a trim chute for receiving the trim strip, said method comprising:

engaging said trim strip on a cylindrical rotary trim biasing and guiding surface associated with said lower slitting means;

retaining said trim strip in wrapping engagement on said rotary surface by pressure differential and thereby positively transporting the trim strip on said surface away from said severance point into said chute;



at a point spaced from said severance point stripping the trim strip from said rotary surface for onward movement in said chute;

providing said surface with air groove means, and in high speed rotation of said surface developing negative pressure in said groove means relative to the ambient air;

and supplementing the air in said groove means and thereby enhancing pressure differential between said grooves and the ambient air.

4,329,894

CUTTING MACHINE

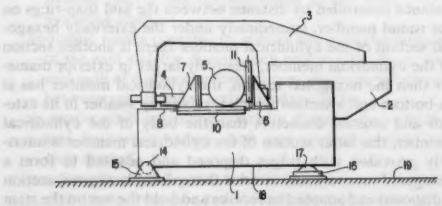
Paul Stolzer, Achern, Fed. Rep. of Germany, assignor to Keuro Maschinenbau Gesellschaft mit beschränkter Haftung & Kommanditgesellschaft, Achern, Fed. Rep. of Germany

Filed Sep. 16, 1980, Ser. No. 187,632

Claims priority, application Fed. Rep. of Germany, Sep. 22, 1979, 7926952[U]

Int. Cl.³ B26D *7/02*

U.S. Cl. 83—156 **8 Claims**



1. In a cutting machine composed of a machine base carrying a workpiece table defining a workpiece support surface, workpiece feed means in the form of rollway presenting a workpiece carrying surface and disposed for feeding a workpiece onto the table, and a pair of clamping jaws mounted on the workpiece table for permitting passage therebetween of a workpiece fed by the feed means, at least one of the clamping jaws being movable relative to the other jaw in a direction transverse to the direction of feed effected by the feed means for clamping a workpiece on the table, the improvement comprising: means supporting said machine base for pivotal movement about a pivot axis which is substantially horizontal and parallel to the feed means feed direction; and vertical displacement means operatively associated with said machine base for pivoting said base between a workpiece feed position in which said workpiece support surface is below said workpiece carrying surface and a workpiece cutting position in which said workpiece support surface is substantially aligned with said workpiece carrying surface.

4,329,895

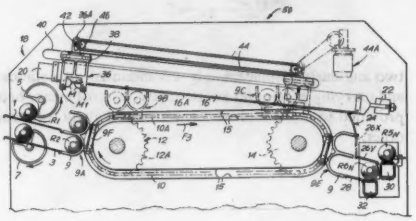
MACHINE FOR CUTTING SIMULTANEOUSLY ONE OR MORE ROLLS OR STICKS OF PAPER TO OBTAIN A PLURALITY OF SMALL ROLLS

Guglielmo Perini, Via delle Cartiere, Botticino, Lucca, Italy

Filed Apr. 21, 1980, Ser. No. 142,148

Int. Cl.³ B26D *1/03, 3/16, 7/12*

U.S. Cl. 83—174 **6 Claims**



1. A machine for transversely cutting elongated paper rolls into a plurality of cut paper rolls comprising means for transporting the rolls to be cut through a feedpath, a plurality of thin elongated cutting blades, each of said cutting blades having a cutting edge fixedly mounted in a plane parallel to and spaced from each other plane and overlying said feedpath, said feedpath and said cutting edge being disposed at an incline relative to each other, a roll holder mounted to said transporting means for movement therewith, said roll holder having two contiguous trough-shaped seats arranged normally to said feedpath and in each of which one of two elongated paper rolls to be cut simultaneously is placed, said seats having an arcuate seating surface conforming to the circumference of the elongated paper rolls to be cut, said seats having a plurality of slits at spaced intervals aligned with said cutting edges for guidingly receiving one of said cutting edges in one of said slits as the respective roll holder is transported through said feedpath, blade sharpening means mounted to each of said cutting blades for movement in parallel translation of the respective cutting edge thereof for sharpening said cutting edge, and means for driving said blade sharpening means in a reciprocating movement along the length of said cutting edge to continuously sharpen said cutting edge following the transport of said roll holder through said feedpath.

4,329,896

SLITTER FOR SEVERING LAMINATED OBJECTS

Karl Singer, 2282 Thorntree, Palatine, Ill. 60067

Filed Apr. 9, 1980, Ser. No. 138,534

Int. Cl.³ B26D *5/22*

U.S. Cl. 83—210 **2 Claims**

2. A slitting machine for slitting laminate material between adjacent articles in a continuous web of said articles, said articles having borders, the borders of adjacent articles being overlapped and encased by said laminate material to form said continuous web, said slitting machine comprising:

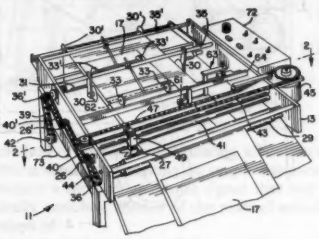
web drive means for advancing said web of laminated articles through said slitting machine;

cutting means including a cutter having oppositely-facing cutting blades for slitting said web;

cutting means drive means for moving said cutting blades of said cutting means back and forth across said web of laminated articles, said cutting blades being operable to

slit said laminate material between said overlapped portion of adjacent articles in both directions across said web;

electrical control circuitry, said control circuitry including means to selectively activate said web drive means and said cutting means drive means for synchronized operation, said control circuitry activating said web drive means to advance said web of laminated articles in alignment with one of said cutting blades, and to stop said web whereupon said control circuitry activates said cutting means drive means for moving said cutting blades across said web to slit said laminate material between said overlapped portion of adjacent articles; and



said electrical control circuitry including roller sensor means, said roller sensor means contacting said web of laminated articles as said web advances along said slitting machine, said roller sensor means moving upwardly relative to said web as said roller sensor means contacts said overlapped portion of adjacent articles, said electrical control circuitry being activated in response to said upward movement of said roller sensor means for controlling said web drive means and said cutting means drive means.

4,329,897

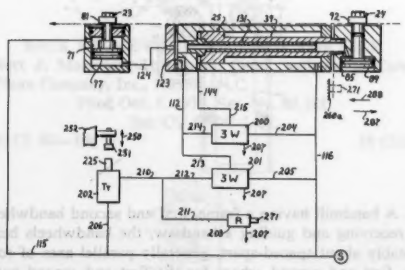
CONTROL SYSTEM FOR PNEUMATIC PUNCH PRESS FEEDERS

Albert W. Scribner, 6 Country Club Rd., Darien, Conn. 06820

Filed Mar. 13, 1979, Ser. No. 20,174

Int. Cl.³ B26D *5/20*

U.S. Cl. 83—225 **14 Claims**



1. A pneumatic feeder for intermittently advancing stock into the work station of a punch press or the like; comprising a frame;

a feed slide reciprocally mounted on said frame;

stock gripping means mounted said feed slide;

main fluid motor means for actuating said feed slide;

stock gripping fluid motor means for actuating said stock gripping means;

main valve means for controlling the operation of said fluid motor means;

trigger means operative to control said valve means so as to cause initiation of a feed stroke of said feed slide; and

reverse means operative in response to the terminal portion of said feed stroke for controlling said valve means so as to cause initiation of an index stroke of said feed slide;

said main valve means comprising

a first three-way valve that is adapted to be controlled by said trigger means and having an output line that is connected as to operate said stock gripping fluid motor means; and

a second three-way valve that is adapted to be controlled by said output line from said first three-way valve and having an output line that is connected so as to operate said main fluid motor means for actuating said feed slide.

4,329,898

APPARATUS FOR SUBDIVIDING A WEB OF WRAPPING MATERIAL INTO SECTIONS OF PREDETERMINED LENGTH

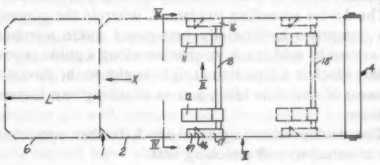
Karl-Heinz Pawelko, Marschacht, and Reinhard Deutsch, Geesthacht, both of Fed. Rep. of Germany, assignors to Hauni-Werke Körber & Co. KG., Hamburg, Fed. Rep. of Germany

Filed Mar. 3, 1980, Ser. No. 126,701

Claims priority, application Fed. Rep. of Germany, Mar. 30, 1979, 2912679

Int. Cl.³ B26D *7/01*

U.S. Cl. 83—251 **14 Claims**



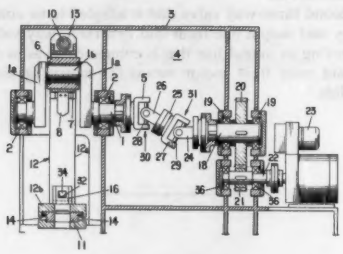
1. Apparatus for subdividing a continuous elongated web of flexible material having notches which are provided in at least one marginal portion thereof and are spaced apart from each other, as considered in the longitudinal direction of the web, into sections of predetermined length, comprising first advancing means which is actuatable at intervals to move the web lengthwise in a predetermined direction, always through a distance approximating but being less than said predetermined length, said first advancing means comprising at least one gripper which engages the web while the web is moved by said first advancing means; second advancing means which is actuatable to engage the web and to complete the movement of the web in said direction through a distance which matches said predetermined length without appreciable interruption between the movements which the web respectively receives from said first and second advancing means, said second advancing means comprising at least one entraining member which enters a notch of the web to thereby advance the web in said direction during actuation of said second advancing means; means for maintaining the notch which is about to be entered into by said entraining member in a predetermined position; and means for severing a section from the leader of the web upon completion of each movement of the web through a distance which matches said predetermined length.

4,329,899

DEVICE FOR CONVERTING ROTARY MOTION OF CRANK MECHANISM INTO LINEAR MOTION FOR A FLYING CUTTER

Shinichi Hori, Amagasaki, Japan, assignor to Asada Machinery Manufacturing Co., Ltd., Amagasaki, Japan

Filed May 12, 1980, Ser. No. 148,913
Claims priority, application Japan, Nov. 26, 1979, 54-153334
Int. Cl.[3] B26D *1/56*
U.S. Cl. 83—320 6 Claims



1. A device for converting rotary motion into uniform linear motion, comprising: a rotatably drivable crank mechanism having a crank shaft; a slide block; means connecting the slide block to the crank mechanism to effect the linear motion thereof in response to rotation of the crank mechanism; rotary drive means having a drive shaft which is out of axial alignment with said drive shaft; and means operatively connecting the drive shaft to the crank shaft to effect uniform linear motion of the slide block comprising an intermediate shaft disposed at a given angle of inclination with respect to the drive shaft and crank shaft and two out of phase cross type universal joints connected to opposite ends of the intermediate shaft and to the crank and drive shafts at a given angle of intersection.

2. The device according to claim 1, wherein the connecting means comprises horizontally juxtaposed guide members, a slider moved by said crank mechanism along a guide groove in said slide block in a direction at right angles to the direction of movement of said slide block and an attaching seat formed on said slider.

5. The device according to claim 2, further comprising a cutter attached to said attaching seat.

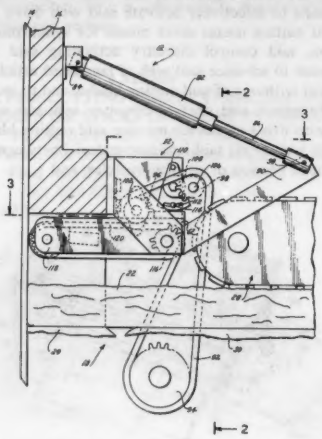
4,329,900

BACON SLICING MACHINE

Edmund G. Dennis, Belle Tenne, and C. Edward Brandmaier, Centerport, both of N.Y., assignors to Cashin Systems Corporation, Hauppauge, N.Y.

Filed Jan. 11, 1980, Ser. No. 111,325
Int. Cl.[3] B26D *7/06*
U.S. Cl. 83—355 14 Claims

1. A slicing machine having: a slicing blade; a feed means for positively driving in a controlled manner product having a trailing end towards the blade at a predetermined rate while maintaining proper orientation of said product to insure uniform slice thickness as the trailing end of the product is sliced, said feed means includes a hold down means wherein said hold down means comprises at least one rotatable gripper engagable with the product at a point adjacent the blade, and control means controlling the rotation of said gripper and consequently the rate of advancement of the product towards the blade.

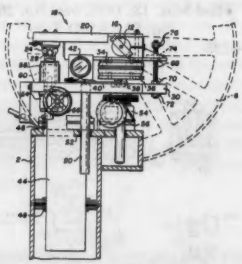


4,329,901

ELASTOMERIC STRAIN SYSTEM FOR BANDMILLS

Brian T. Stroud, Richmond, Canada, assignor to CAE Machinery Ltd., Vancouver, Canada

Filed Jun. 2, 1980, Ser. No. 155,738
Int. Cl.[3] B23D *55/10*; B27B *13/08*
U.S. Cl. 83—819 16 Claims

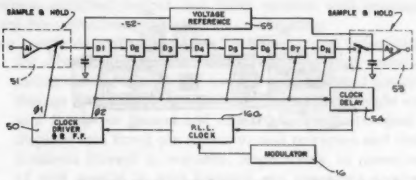


1. A bandmill having a frame, first and second bandwheels for receiving and guiding a bandsaw, the bandwheels being rotatably about spaced-apart, generally parallel axes of rotation, first and second arbors for the first and second bandwheels respectively, means mounting the first arbor on the frame against movement towards and away from the second arbor, means mounting the second arbor on the frame for limited movement towards and away from the first arbor, and a strain mechanism for the bandsaw comprising a bearing member including a carrier arm for the second arbor and a resilient strain source comprising solely an elastomeric member compressibly received between the carrier arm and the frame and having sufficient rigidity to support the carrier arm and any load applied thereto during operation of the bandmill.

4,329,902
ELECTRONIC METHOD AND APPARATUS FOR MODIFYING MUSICAL SOUND

David A. Love, Garden Grove, Calif., assignor to Beehler, Mockabee, Arant & Jagger, Los Angeles, Calif.

Filed Jan. 24, 1980, Ser. No. 115,057
Int. Cl.³ G10H 1/04
U.S. Cl. 84—1.25 8 Claims



1. A method of frequency-modulating a continuously varying electrical signal representing an original musical sound so as to produce a modulated output signal that will provide a harmonically enriched version of the musical sound, comprising the steps of:

generating a clock-pulse signal at a repetition rate of at least about 200,000 per second;

frequency-modulating the clock-pulse signal according to an essentially sine-wave signal having a frequency of less than fifteen Hertz;

combining the modulated clock-pulse signal with the continuously varying electrical signal to produce a series of pulses whose amplitude envelope corresponds to that of the continuously varying electrical signal;

supplying the series of pulses to the input end of a multistage shift register;

applying the modulated clock-pulse signal to all stages of the shift register so as to advance the series of pulses therealong and thereby produce a series of delayed pulses at its output end;

at the output end of the shift register, gating a central portion only of each of the delayed pulses so as to exclude both its leading and trailing edges;

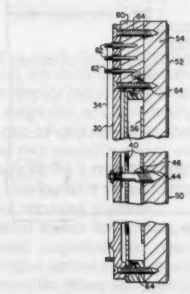
utilizing the gated pulses to create a frequency-modulated version of the original amplitude envelope; and

then producing the output signal in response to said frequency-modulated version of the original amplitude envelope.

4,329,903
BACK FRAME FOR A PIANO OR THE LIKE

Robert J. Mayerjak, Torrington, Conn., assignor to Currier Piano Company, Inc., Marion, N.C.

Filed Oct. 1, 1979, Ser. No. 80,181
Int. Cl.³ G10C 3/04
U.S. Cl. 84—186 R 15 Claims

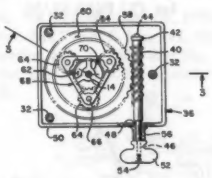


1. A back frame of integrated design supporting the tensioned strings in a piano or like instrument comprising a laminated composite structure of geometric form corresponding to the back of the instrument and having generally parallel front and rear surfaces with openings for sound through the structure from one of said surfaces to the other and a plurality of integral beams extending between one side and another of the geometric form, the laminated structure including an outer rear laminate of metal defining the rear surface of the structure, a base laminate integrally bonded to the rear metal laminate and holding the metal laminate in spaced relationship from the strings to support the strings under load and an outer front laminate of metal at the front surface of the structure, the front laminate being integrally bonded to the base laminate and held by the base laminate in spaced and generally parallel relationship with the outer rear laminate of metal for frame stiffness and rigidity.

4,329,904
TWO-SPEED TUNING MACHINE FOR MUSICAL INSTRUMENTS

John Monteleone, 365 Smith Ave., Islip, N.Y. 11751

Filed May 16, 1980, Ser. No. 150,308
Int. Cl.³ G10D 3/14
U.S. Cl. 84—306 10 Claims



1. A two-speed tuning machine for a stringed-instrument, comprising:

a first input shaft, a second input shaft, and an output shaft;

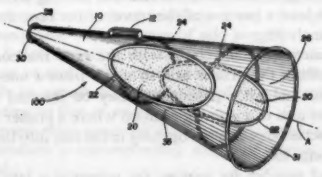
first gear means for converting a first angular rotation of said first input shaft into a second angular rotation of said output shaft, said second angular rotation of a reduced angular arc with respect to said first angular rotation; and

second gear means for converting a third angular rotation of said second input shaft into a fourth angular rotation of said output shaft, the rate of rotation of said output shaft being a predetermined fraction of the rate of rotation of said second input shaft while maintaining invariant the relative angular rotational relationship of said first input shaft and said output shaft.

4,329,905
SOUND GENERATING APPARATUS

Max T. Lloyd, Rte. 2, Dickerson, Md. 20753

Filed Oct. 14, 1980, Ser. No. 196,328
Int. Cl.³ G10D 13/02; G10K 11/00
U.S. Cl. 84—411 R 14 Claims



1. A portable sound generating device for mechanically amplifying voice and percussive sound in an assembly of unitary construction comprising:

(a) a flared horn portion including a horn mouth and a voice opening for projecting sound in a desired directional sound radiation pattern; and

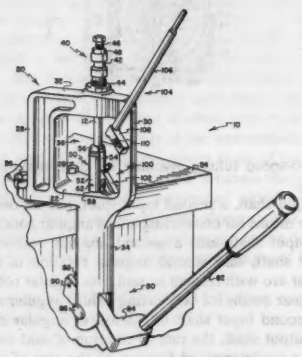
(b) vibratile membrane means secured within and substantially entirely covering an opening formed in the body of said horn portion, and appropriately tensioned to produce a drum sound when excited by percussion.

4,329,906

RELOADING APPARATUS HAVING IMPROVED PRIMER MECHANISM

Edward A. Heers, Grand Island, Nebr., assignor to Hornady Manufacturing Company, Grand Island, Nebr.

Filed May 19, 1980, Ser. No. 150,802
Int. Cl.[3] F42B *33/10*
U.S. Cl. 86—36 17 Claims



1. Reloading apparatus for holding a casing and inserting a primer cap into the base of the casing, comprising:

an elongate ram movable vertically between an uppermost position and a lowermost position, the ram including means by which the base of a casing may be secured to the ram and maintained stationary with respect to the ram;

the ram including an opening to provide communication with the base of a casing secured to the ram;

a primer arm for carrying a primer cap and inserting the primer cap into the base of a casing by the ram, the primer arm being connected to the ram and moving with the ram for at least a portion of the travel of the ram, the primer arm including:

a first member connectable with the ram, the connection permitting the primer arm to move from a non-priming position where a primer cap may be inserted into the primer arm to a priming position where a primer cap may be inserted through the opening in the ram into the base of a casing; and

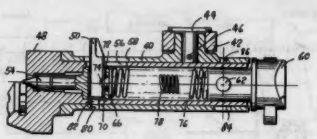
a second member for moving the primer arm into priming position and for disengaging the connection between the priming arm and the ram whereby, upon movement of the ram, the priming arm moves relative to the ram and inserts a primer cap into the base of a casing secured to the ram.

4,329,907

GUN BOLT FOR HIGH RATE OF FIRE REVOLVING BATTERY GUNS

Robert G. Kirkpatrick, Shelburne; Ronald R. Snyder, Georgia, and Lincoln L. Sibley, Jr., Burlington, all of Vt., assignors to General Electric Company, Burlington, Vt.

Filed Feb. 4, 1980, Ser. No. 118,026
Int. Cl.[3] F41D *7/02*
U.S. Cl. 89—12 4 Claims



1. A gun bolt for a Gatling type gun including:

a gun bolt carriage;

a gun bolt head journaled in a longitudinally extending bore in said carriage;

a firing pin journaled in a longitudinally extending bore in said gun bolt head;

a cocking pin disposed in a tranversely extending bore in said firing pin and extending through a transversely extending bore in said head and a transversely extending bore in said carriage;

a detent disposed in said longitudinal bore of said head aft of said firing pin and having a portion thereof extending forwardly through a longitudinally extending bore in said firing pin into a cavity in said cocking pin;

and

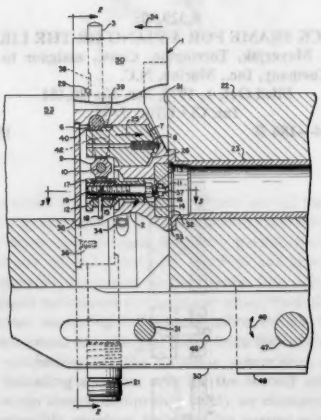
spring means disposed in said longitudinal bore of said head aft of said detent and biasing said detent into engagement with said cocking pin.

4,329,908

RECOIL-OPERATED FIRING PIN RETRACTOR FOR ELECTRICALLY-FIRED GUNS

Kenneth C. Rowlands, Utica, N.Y., assignor to Remington Arms Company, Inc., Bridgeport, Conn.

Filed Jun. 26, 1980, Ser. No. 163,308
Int. Cl.[3] F41F *11/02, 13/08*
U.S. Cl. 89—24 10 Claims



1. A recoil-operated firing pin retractor for use in an electrically-fired gun which includes a barrel having a rear breech opening; a yoke secured to said barrel and formed with a

passage extending transversely to the length of said barrel and intersecting said breech opening; a breechblock received in said passage and having a front surface slidably engageable with said breech opening of said barrel; means for reciprocating said breechblock in said passage between positions in which said front surface thereof opens and closes said breech opening; and electrical firing pin means reciprocable in said breechblock between a firing position protruding from said front surface for extension into said breech opening into electrical firing contact with a shell received in said barrel, and a position retracted behind said front surface; said improved firing pin retractor comprising, in combination:

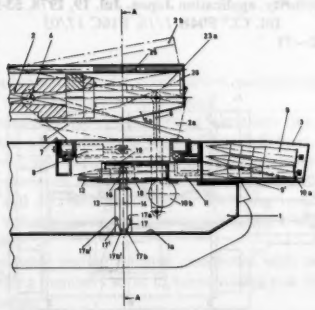
an inertia weight reciprocably received in said breechblock for movement between forward and rearward positions; means biasing said weight toward said rearward position; linkage means drivingly inter-connecting said weight with said firing pin means and constructed and arranged to displace said firing pin means to said retracted and firing positions thereof in response, respectively, to movement of said weight to said forward and rearward positions thereof; and releasable latching means constructed and arranged for latching said weight in place in response to movement of said weight to said forward position thereof; recoil movement of said gun responsive to firing a shell being operative to produce inertial movement of said weight into said forward position and into latched engagement with said latching means, thereby positioning and releasably retaining said firing pin means in said retracted position.

4,329,909

FEEDING DEVICE FOR ROUNDS IN SELF-PROPELLED GUN

Erling Tidström, Karlskoga, Sweden, assignor to Aktiebolaget Bofors, Bofors, Sweden

Filed Dec. 7, 1979, Ser. No. 101,399
Claims priority, application Sweden, Dec. 14, 1978, 7812841
Int. Cl.³ F41F 9/04
U.S. Cl. 89—46 **10 Claims**



1. In a gun truck having a moveable gun supported in a cradle carrier mounted on a rotatable platform on said truck chassis, a device for individually feeding rounds of ammunition between a magazine and a ramming position located at the immediate rear of said moveable gun, said device comprising:

round carrying assembly means within said truck chassis for vertically lifting a round of ammunition from a predetermined base position aligned with an exit of said magazine and said ramming position;

displacement means for feeding said round of ammunition from said magazine exit onto said carrying assembly means upon arrival at said predetermined base position;

lifting means for lifting said round carrying assembly means and said round of ammunition supported thereon from said predetermined base position to said ramming position, and for returning said round carrying assembly means to said predetermined base portion;

first guiding means for automatically adjusting the elevational orientation of said round of ammunition to correspond to the elevational orientation of said gun upon arrival of said round of ammunition at said ramming position; and,

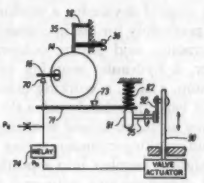
second guiding means moveable with said platform between said predetermined base portion and said ramming position for automatically adjusting the transverse orientation of said round carrying assembly means and round of ammunition supported thereon during vertical movement of said round carrying assembly means toward said ramming position, whereby said round of ammunition assumes a new transverse orientation corresponding to the transverse orientation of said gun upon arrival of said round of ammunition at said ramming position.

4,329,910

TRANSDUCER ASSEMBLY PROVIDING POSITION OUTPUT PROPORTIONAL TO ELECTRICAL INPUT SIGNAL

Everett O. Olsen, Wrentham; Robert F. Estes, Foxboro; Paul W. Rezendes, New Bedford, all of Mass., and George F. Williams, Rumford, R.I., assignors to The Foxboro Company, Foxboro, Mass.

Division of Ser. No. 972,096, Dec. 21, 1978, which is a continuation of Ser. No. 776,575, Mar. 11, 1977, abandoned. This application Feb. 8, 1980, Ser. No. 119,703
Int. Cl.³ F15B 9/10, 13/044
U.S. Cl. 91—375 R **3 Claims**



1. A pneumatically-operated current-to-valve position transducer comprising:

a housing;

a motor having a rotatably mounted coil within said housing adapted to receive an input current;

force restraining means opposing the movement of said coil and arranged to maintain the resultant angular rotation thereof at a position corresponding to the magnitude of the input current;

a pneumatic flapper and a pneumatic nozzle, said flapper being mounted on said coil at a position radially-offset from the rotational axis thereof, thereby to effect arcuate motion of said one element with rotary motion of said coil, and said nozzle being movably mounted to said housing;

said flapper being perpendicularly disposed with respect to said nozzle and adapted to move toward said nozzle when current is applied to said coil thereby reducing the spacing between said nozzle and said flapper and correspondingly increasing the back pressure of said nozzle;

elastic force-producing means having one part fixed with respect to said housing and another part coupled to said nozzle to permit movement thereof over a range corresponding to that of said flapper;

a pneumatic relay receiving the back pressure of said nozzle to produce a corresponding amplified output pressure signal;

valve actuator means responsive to said output pressure signal for producing a corresponding valve stem displacement;

means including said elastic force-producing means for

transforming said valve stem displacement into a change of position of said nozzle that corresponds essentially linearly with the movement of said flapper, whereby said valve stem displacement is proportional to said applied input current.

4,329,911

HYDRAULIC REGULATING DEVICE FOR A WORKING CYLINDER OF AN AGRICULTURAL VEHICLE

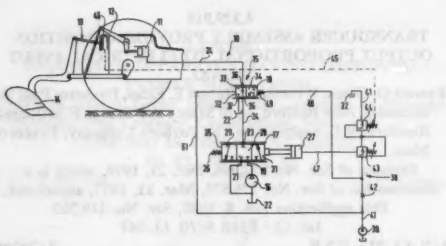
Günter Schwerin, Möglingen, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Aug. 1, 1979, Ser. No. 62,897

Claims priority, application Fed. Rep. of Germany, Aug. 30, 1978, 2837795

Int. Cl.[3] F15B *13/042*

U.S. Cl. 91—387 7 Claims



1. A hydraulic control device for a working unit of an agricultural vehicle, preferably for use in connection with a lifting unit of a farm tractor, said device comprising a hydraulic working cylinder, a hydraulic working circuit including a working fluid pump, a tank, a working conduit, a directional multi-way control valve provided with a sliding member, said control valve being arranged in said working conduit between said pump and said working cylinder, spring means for biasing one end of said sliding member into a position in which said working conduit communicates with said tank; a hydraulic setting cylinder for biasing the other end of said sliding member; a hydraulic control circuit for said setting cylinder including a control fluid pump, a main control conduit, an adjustable pressure reducing valve and an adjustable pressure relief valve arranged in series in said control conduit between said control fluid pump and said tank, and an adjustment pressure conduit branching from said main control conduit upstream of said pressure reducing valve and being hydraulically connected to said setting cylinder to apply thereto an adjustment pressure, whereby the pressure difference at one of said adjustable valves indicates the desired condition of said working unit and the pressure difference at the other adjustable valve indicates the actual condition of said working unit.

4,329,912

AUXILIARY POWER STEERING FOR MOTOR VEHICLES

Winfried de Maight, Mutlangen, and Ronald Schütze, Mögglingen, both of Fed. Rep. of Germany, assignors to Zahnradfabrik Friedrichshafen, AG., Friedrichshafen, Fed. Rep. of Germany

Filed Jun. 26, 1979, Ser. No. 52,189

Claims priority, application Fed. Rep. of Germany, Jul. 1, 1978, 2829064

Int. Cl.[3] F15B *13/042*

U.S. Cl. 91—420 12 Claims

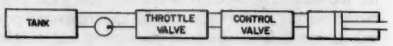
1. In a booster steering system having a pump for booster pressure, a booster steering motor, a control valve and a tank, the improvement comprising:

a non-closing throttle valve for throttling return flow comprising a housing means having a piston chamber (8) and a piston (4) movable therein and having one face exposed therein:

booster pressure flow means (1) communicating booster pressure to the other face of said piston and return flow means (3) connected for return flow to and from said chamber;

a throttle means (6) operative on movement of said piston to effect throttling of return flow through said chamber when said piston is shifted by booster pressure on said other face;

means (5) for biasing said piston to an open throttle condition;



wherein said return flow means comprises an upstream passage leading to said piston chamber for return flow thereto and a downstream passage leading from said piston chamber for return flow therefrom;

said throttle means comprising coacting portions of said downstream passage and said piston wherein said passages are axially spaced in said chamber and said downstream passage having a port directly open on the circumferential wall of said chamber directed thereinto normally adjacent a coacting throttling edge of said piston whereby flow is throttled by movement of said piston across the face of said port, and means (7) for limiting movement of said piston, when acted upon by booster pressure, to a predetermined maximum extent to ensure throttling flow.

4,329,913

STRUCTURE OF A SHOE FOR A SWASH PLATE TYPE COMPRESSOR

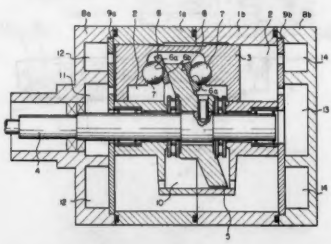
Shozo Nakayama; Kimio Kato; Takamitu Mukai; Tomoo Fujii, and Hiroya Kono, all of Kariya, Japan, assignors to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho, Aichi, Japan

Filed Jul. 6, 1979, Ser. No. 55,469

Claims priority, application Japan, Jul. 19, 1978, 53-99238[U]

Int. Cl.[3] F04B *1/16;* F16C *17/03*

U.S. Cl. 92—71 2 Claims



1. A shoe generally formed in a round shape and incorporated into a swash plate type compressor for transmitting an axial force from a rotating swash plate secured to a drive shaft, via a ball bearing, to a piston of a compressor which applies an axially reciprocal compression effect to a refrigerant within a cylinder bore of the compressor, comprising:

a first flattened face slidably contacting said swash plate while said swash plate rotates with said drive shaft;

a second face opposite to said first flattened face, said second face being formed with a recess for receiving therein said ball bearing, said recess having a spherical shape portion complementary with a part of said ball bearing and a round bore portion with a bottom thereof, said bottom of said round bore portion being a spherical surface, said round bore portion having a diameter between 40 and

85% of the diameter of said spherical shape portion at said second face, the thickness of said shoe between the bottom of said round bore portion and said first flattened face being in the range of 0.5 to 2 millimeters, said spherical shape portion being concentric with said round bore portion and wherein there is no connecting passage between said round bore portion and said first flattened face.

4,329,914

CYLINDER-PISTON COMBINATION PARTICULARLY FOR HIGH-PRESSURE APPLICATION

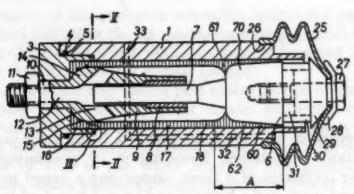
Bernhard Frey, Schaffhausen, Switzerland, assignor to Jydrpwatt Systems Limited, London, England

Continuation of Ser. No. 860,183, Dec. 13, 1977, abandoned, which is a continuation of Ser. No. 639,700, Dec. 11, 1975, abandoned. This application Mar. 6, 1980, Ser. No. 127,590

Claims priority, application Switzerland, Dec. 17, 1974, 16800/74; Nov. 27, 1975, 15354/75

Int. Cl.³ F01B *19/04*

U.S. Cl. 92—105 **17 Claims**



1. A piston and cylinder combination, particularly for high-pressure fluid application, comprising:

two relatively movable working members one of which defines a piston and the other of which defines a cylinder;

said two relatively movable working members defining therebetween a working chamber with strokes of increasing and decreasing alternately operating working chamber volume, one of said strokes defining a high-pressure stroke;

a deformable sealing member connected with each of said working members so as to hermetically seal the working chamber;

a support surface provided at one side of said sealing member for supporting such sealing member against the action of pressure prevailing in the working chamber;

said support surface and said sealing member defining therebetween a lubricant flow passage, said lubricant flow passage including an outlet end comprising a terminal outflow extremity on one side of said lubricant flow passage during said high-pressure stroke and communicating with a low-pressure side defining a low-pressure region in relation to the working chamber pressure;

means for introducing lubricant into the other side of said lubricant flow passage in order to maintain

a flow of lubricant through said lubricant flow passage and out of said outlet end thereof and into said low-pressure side under the action of the pressure in said working chamber at least during part of said high-pressure stroke.

4,329,915

PISTON AND PISTON ROD

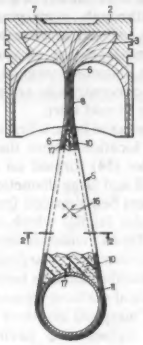
Ralf-Thilo Schulz, Putzbrunn, Fed. Rep. of Germany, assignor to Messerschmitt-Boelkow-Blohm GmbH, Munich, Fed. Rep. of Germany

Filed Apr. 8, 1980, Ser. No. 138,287

Claims priority, application Fed. Rep. of Germany, Apr. 26, 1979, 2916847

Int. Cl.³ F01B *9/02*

U.S. Cl. 92—137 **10 Claims**



1. A piston head and piston rod structure for prime movers having a rotating crankshaft, comprising a loop formed of fiber strands embedded in synthetic resin, said fiber strands forming a bight for holding crankshaft bearing means in said bight at the free end of said piston rod, said fiber strands converging from both sides of said bight toward said piston head for forming a flexible piston rod hinging zone, said strands having ends flaring out of said flexible piston rod hinging zone, and anchoring means operatively securing said flaring strand ends in said piston head, whereby said flexible piston rod hinging zone provides a hinging joint for lateral excursions of the piston rod resulting from crankshaft rotations, said strands, anchoring means and piston head forming an integral structure, without a piston bolt.

4,329,916

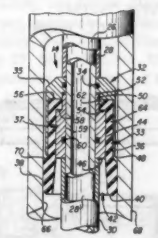
PACKER NOSE ASSEMBLY

George K. Roeder, P.O. Box 4335, Odessa, Tex. 79760

Filed Jan. 5, 1979, Ser. No. 1,093

Int. Cl.³ F16J *9/08*

U.S. Cl. 92—240 **7 Claims**



1. A packer nose assembly (**10**) for pumping downhole equipment of the free type into and out of a tubing string located in a borehole, comprising:

a mandrel (**16**) movable along an axis having a lower end portion (**20**) and an upper end portion (**18**); means forming a fishing neck (**18**) on said upper end portion; means (**20**) on said lower end portion of said mandrel by which said

packer nose assembly can be affixed to downhole equipment;

a cylindrical packer apparatus (12 or 14) comprising a mount member (32 and 37) and a preformed resilient cup (33); said mount member includes an inner member (37) and an outer member (32), said outer member having an upper end portion (35) in the form of a hub which sealingly engages said mandrel therewithin, and a skirt extending from said hub and (36) spaced from and circumferentially extending about said inner member, said inner member having an axial bore (at 28) of a diameter to receive said mandrel therethrough, a marginal length of said inner member being reduced in diameter (at 50) and received within a recessed portion of said hub (at 52), thereby leaving a large diameter marginal length (44) of said inner member concentrically arranged in spaced relationship respective to said skirt;

said hub having an axial bore; a first shoulder (56) formed on said hub at a location where the skirt joins the hub, a second shoulder (54) formed on said inner member between the small and large diameters thereof, said first and second shoulders being spaced from one another to form an upper annulus (at 62) which communicates with another annulus (at 64) which is formed between said skirt and said large diameter marginal length of said inner member, said another annulus being defined by overlying coaxial cylindrical surfaces formed on said skirt and said large diameter marginal length of said inner member;

said preformed resilient cup having an upper marginal length including coaxial cylindrical surfaces (at 64) received within said another annulus; the upper end of said cup terminates in an inwardly directed flange (62) which is received within said upper annulus, the length of said cylindrical cup surface and said another annulus cylindrical surface being substantially greater than the length of said flange;

said cup, inner member, and outer member being concentrically arranged respective to one another with the upper marginal length of the cup being tightly received within said another annulus, and with the flange being received in compressed relationship between the first and second shoulder;

a lower marginal length (38) of the cup extends downwardly and outwardly from the mount member for sealingly engaging a tubing wall.

4,329,917

VENTILATORS AND/OR WINDOWS FOR VEHICLES

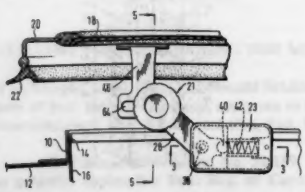
Sidney E. Fisher, Birmingham, and Keith R. Hunt, Devon, both of England, assignors to Britax Weathershields Limited, Birmingham, England

Filed Jan. 22, 1980, Ser. No. 114,427

Claims priority, application United Kingdom, Jan. 23, 1979, 7902429; Jun. 20, 1979, 7921531

Int. Cl.³ B60H *1/26*

U.S. Cl. 98—2.14 **4 Claims**



1. A ventilator for a vehicle comprising a frame adapted to bound an opening in a vehicle roof, a panel, two pairs of support arms, each pair supporting the panel on the frame at a respective one of two opposite ends of the frame, each support arm being pivotally connected at one end to the frame and at the other end to the panel and being provided with spring-loaded detent means at one or other of said ends for holding said arm in any one of a plurality of angularly-spaced positions, the pivotal connection at the end opposite to the detent means of each of said arms comprising a pin which projects through superimposed openings in the arm and a member to which said arm is connected, a boss in which the pin is axially movable and a spring which engages between the pin and the boss so as to clamp the member and the arm together between a formation on the pin and the adjacent end of the boss.

4,329,918

MEANS FOR THE PRODUCTION OF BEER

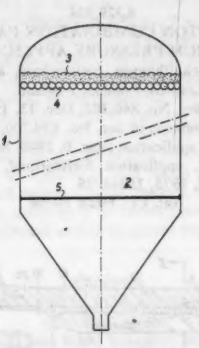
Franz Kühtreiber, Laa an der Thaya, Austria, assignor to Braupatent Universal AG, Basel, Switzerland

Filed Apr. 8, 1980, Ser. No. 138,852

Claims priority, application Austria, Apr. 9, 1979, 2639/79

Int. Cl.³ C12C *5/00*

U.S. Cl. 99—276 **6 Claims**



1. Apparatus for the production of a liquid subjected in its production to flotation, fermentation or post-fermentation with the formation of a foam, comprising a vessel including peripheral walls and a bottom, and in said vessel, at least one substantially closed layer formed of contiguous, semi-submersible spheres floating on the surface of said liquid and confined between said walls, said spheres having an eccentric center of gravity in order to maintain a stable floating position on said surface despite stable flow conditions;

said layer separating said foam from said liquid, preventing said foam from returning to said liquid and protecting said liquid from air in said vessel.

4,329,919

TIME-ENERGY CONSERVING LOW COST HOME PRESSURE COOKING SYSTEM

Ariel A. Andersen, 1074 Ash Ave., Provo, Utah 84601

Continuation-in-part of Ser. No. 960,215, Nov. 13, 1978, abandoned. This application Nov. 23, 1979, Ser. No. 96,851

Int. Cl.³ A23L *3/00*

U.S. Cl. 99—359 **1 Claim**

1. An apparatus for pressure canning, pressure sterilizing and pressure cooking foods and the like with steam comprising:

an enclosure comprising pressure cooker hollow, vertically shallow body means and pressure cooker hollow, vertically elongated lid means disposed above the cooker body means, the body means and the lid means each comprising wall means;

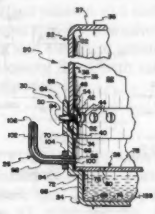
annular lap joint means between the body means and the lid means at a relatively low elevation on the apparatus, the lap joint means comprising a perimeter site where the wall means of the lid means and the wall means of the body means overlap and a plurality of male and a plurality of interrelated L-shaped female fastener means carried by

the lid means and the body means, the fastener means being clamped and unclamped at the perimeter site solely by relative rotation of the lid means and the body means;

annular elastomeric seal means interposed between the body means and the lid means interiorly at the lap joint means to create a first annular sealing site with the lid means and a second annular sealing site with the body means to prevent air and steam leakage, the annular seal means comprising surface means which responsive to increasing vapor pressure within the apparatus correspondingly causes an increase in the sealing force at both the first and second sealing sites;

a shallow water reservoir at the bottom interior of the enclosure;

food container supporting perforated platform means disposed a small distance above the bottom interior of the enclosure immediately above the top of the water reservoir;



the region of the enclosure above the perforated platform means and below the lid means comprising a steam-receiving chamber in which said containers of food and the like are cooked, sterilized and/or canned;

air escape-steam trap valved port means carried by the body means below the lap joint means extending entirely through the wall of the body means immediately above the perforated platform means whereby, upon the application of heat to the water reservoir and generation of steam, steam passing through the perforations of the platform means thereafter becomes disposed adjacent the lid and, upon continued accumulation, fills from top down to force residual air within the enclosure downward in the chamber and laterally outward from the enclosure through the air escape-steam trap valved port means and simultaneously forces against the seal means to prevent escape of steam at the lap joint site.

4,329,920

SANDWICHING MACHINE AND TURN-OVER MECHANISM THEREFOR

Edward Rose, Skokie, and David E. Weber, Chicago, both of Ill., assignors to Peters Machinery Company, Subsidiary of Katy Industries, Inc., Chicago, Ill.

Filed May 2, 1980, Ser. No. 145,989

Int. Cl.³ A21C 9/04

U.S. Cl. 99—450.4 **14 Claims**

1. In an apparatus for sandwiching cookies, cakes and the like conveyed from a baking oven and having designs impressed on one side thereof and plain sides facing the oven,

a frame,

a conveyor extending along said frame,

longitudinally spaced upstream and downstream magazines extending over said frame and conveyor and retaining the cookies in vertical stacks,

means supplying cookies to said magazines directly from the oven as baked design sides up,

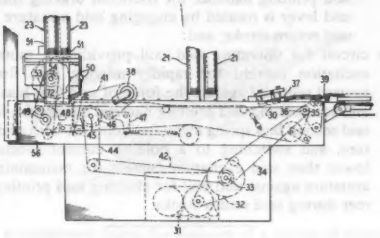
means extending over said conveyor between the upstream and downstream magazines for supplying a measured amount of creme to the upstream cookies as they pass thereunder,

a turnover wheel in cookie receiving relation with respective to the upstream magazine and having a plurality of equally spaced cookie receiving receptacles recessed therein and spaced within the circumferential margin thereof,

each receptacle having a shallow leading end and a deeper trailing end and having a chordal bottom between said leading and trailing ends, both leading and trailing ends opening to the circumference of said wheel,

flanges spaced from opposite sides of said turnover wheel spaced apart a distance substantially equal to the diameter of the cookies to be turned over,

an upper cookie support extending along each side of said turnover wheel between said flanges and having aligned support surfaces parallel to the bottoms of the cookies in said magazine, and beneath the top of the discharge end of



said magazine a distance substantially equal to the thickness of a cookie to be turned over, and

supporting the stack of cookies in said magazine with the bottom cookie of the stack in position to be engaged by the trailing end of a respective receptacle to be advanced along said support and deposited into said receptacle, and

a retainer extending circumferentially about said wheel within said flanges and having an upper leading end extending generally tangentially of the periphery of said flanges and a bottom trailing end supporting the cookies to be deposited on said conveyor and extending generally tangentially of the periphery of said flanges, and a stripper extending along opposite sides of said wheel for stripping the bottom cookies from their receptacles as they pass thereby along the trailing end of said retainer and onto said conveyor extending therebeneath, design sides down.

4,329,921

DAMPING DEVICE FOR AN ELECTROMAGNETICALLY DRIVEN PRINTING HAMMER

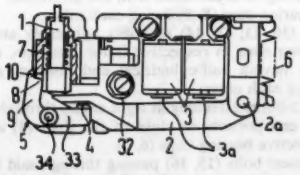
Dieter Treiber; Adam Kling, and Ulrich Heider, all of Munich, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed May 27, 1980, Ser. No. 153,742

Claims priority, application Fed. Rep. of Germany, Aug. 20, 1979, 2933616

Int. Cl.³ B41J 9/42

U.S. Cl. 101—93.02 **7 Claims**



1. In a system for actuating a printing hammer including at

least one electromagnetic coil and a pivotable armature engageable with said printing hammer and magnetically attractable to said coil, said armature and said printing hammer being normally urged to a rest position by respective first and second bias springs, a device for damping said printing hammer during a return stroke after a printing stroke comprising:

a rotatably mounted angle lever carrying a stop surface on a first arm thereof,

said stop surface disposed in the movement range of said armature for limiting movement of said armature and said printing hammer during said return stroke and absorbing kinetic energy therefrom,

said lever being rotated by said armature during said return stroke,

said lever having a second arm disposed substantially perpendicularly to said first arm having a frictional abutment surface which is moved into engagement with said printing hammer for frictional braking thereof as said lever is rotated by engaging said armature during said return stroke; and

a circuit for operating said coil providing a momentary excitation current for rapidly moving said first arm toward said coil against the force of said first bias spring and accelerating said printing hammer against the force of said second bias spring away from contact with said armature, and switching to a holding current substantially lower than said excitation current for maintaining said armature against said coil for abutting said printing hammer during said return stroke.

4,329,922
PRINTING MACHINE CYLINDER SHAFT ATTACHMENT ARRANGEMENT

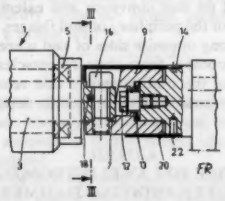
Nikolaus Nawrath, Igenhausen, Fed. Rep. of Germany, assignor to M.A.N.-ROLAND Druckmaschinen Aktiengesellschaft, Offenbach am Main, Fed. Rep. of Germany

Filed Feb. 3, 1981, Ser. No. 231,161

Claims priority, application Fed. Rep. of Germany, Feb. 9, 1980, 3004921

Int. Cl.³ B41F *13/24*

U.S. Cl. 101—248 **10 Claims**



1. In a printing machine,

a cylinder-shaft attachment arrangement having

a non-rotatable shaft (3);

a cylindrical shell (2);

axially staggered bearings (4, 5) between the shaft and the shell and journaling the shell on the shaft;

and means secured to the shaft to attach the shaft to printing machine frame members (FL, FR)

comprising, in accordance with the invention,

two bearing cups (8, 9) facing each other;

means (10, 11; 12, 14) rotatably adjustably attaching said bearing cups to respective frame members, said bearing cups having half-cylindrical end portions at the sides facing each other;

through-bores extending at right angles through the respective end portions or stubs of the shaft (3) and into the respective bearing cups (6, 7);

attachment bolts (15, 16) passing through said bores in the end portions or stubs of the shaft and into the bearing cups to attach the shaft ends to the bearing cups;

and positioning pins (17, 18) extending transversely with respect to the shaft, one at each end, and fitting on the respective half-cylindrical end portions of the bearing blocks for aligning the rotatably adjustable bearing cups so that the through-bores in the shaft ends and in the bearing cups will self-align for passing the attachment bolts therethrough.

4,329,923
INKING CONTROL APPARATUS FOR PRINTING MACHINES

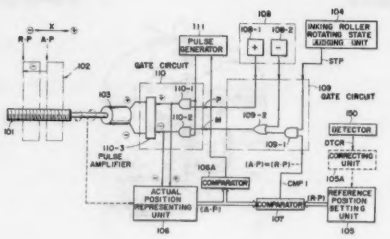
Mitsuhiko Iida, Zama, Japan, assignor to Toshiba Kikai Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 23, 1980, Ser. No. 219,579

Claims priority, application Japan, Dec. 27, 1979, 54-170923

Int. Cl.³ B41F *31/04, 31/06*

U.S. Cl. 101—365 **5 Claims**



1. Inking control apparatus for use in a printing machine including an inking roller, an adjusting piece confronting said inking roller for defining therebetween an ink reservoir and an adjustable gap communicated with said ink reservoir for supplying a quantity of ink; and drive means for reciprocating said adjusting piece toward and away from said inking roller to adjust said gap to a predetermined width, said inking control apparatus comprising:

actual position representing means for storing data corresponding to the gap width between said inking roller and said adjusting piece for representing an actual position thereof;

reference position setting means for setting a reference position for said adjusting piece, said reference position forming a gap between said inking roller and said adjusting piece of a width sufficient to prevent said ink from leaking through said gap;

comparator means for comparing outputs of said actual position representing means and said reference position setting means for producing an output until said outputs coincide with each other;

inking roller rotating state judging means which produces a stop signal when said inking roller stops to rotate or approaches to a stop state; and

gate circuit means supplied with said output of said comparator means for operating said drive means in accordance with said stop signal thereby maintaining said adjusting piece at said reference position while said inking roller is being stopped.

4,329,924
ELECTRIC PRIMER WITH CONDUCTIVE COMPOSITION

Guy J. Lagofun, Tarbes, France, assignor to Etat Francais represente par le Delegue General pour l'Armement, Paris, France

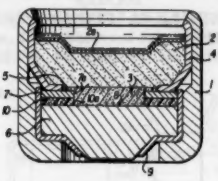
Filed Sep. 11, 1979, Ser. No. 74,541

Int. Cl.³ F42C *19/12*

U.S. Cl. 102—202.8 **5 Claims**

1. Electrical primer comprising a conductive pyrotechnical

priming composition placed in contact with a useful pyrotechnical charge, and two electrodes in electrical contact with the conductive pyrotechnical composition, the two electrodes being further connected to a stable electrical resistor whch is thereby connected in parallel to the conductive pyrotechnical composition, one of the electrodes comprising a metallic



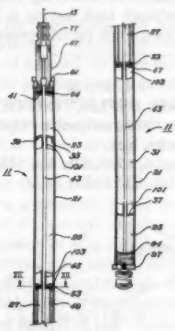
washer, the remaining of said electrodes comprising a metallic body having a flat surface parallel to a surface of said washer, said surfaces being separated by a washer of electrical resistance material forming said electrical resistor, and said washers forming a cylindrical cavity filled with said conductive pyrotechnical priming composition.

4,329,925

FRACTURING APPARATUS

Paul C. Hane, and Harold D. Moore, both of Longview, Tex., assignors to Frac-Well, Inc., Longview, Tex.

Filed Jun. 17, 1980, Ser. No. 160,191
Int. Cl.³ F42B *1/02;* E21B *29/02*
U.S. Cl. 102—310 **8 Claims**



1. In apparatus for fracturing a subterranean formation, including:

a. elongate casing having a center and two ends;

b. opposed end charges disposed at each end of said casing and adapted to direct respective explosions toward said center; and

c. A central charge disposed at said center and adapted to create a central zone of high pressure upon detonation; the improvement comprising:

d. having said central charge being substantially centrally located along the axial length of said casing and said end charges for creating a central area of high pressure upon detonation;

e. having each of said end charges adapted to direct an explosive force inwardly to contain the explosion of said center charge and to detonate an intermediate charge;

f. a pair of intermediate charges disposed respectively between said central charge and each of said end charges, said intermediate charges comprising elongate driver for enhancing and sustaining the exceptionally high pressure generated by the combination of said central charge explosion and said end charge explosions for propagating a fracture more deeply into said subterranean formation; and

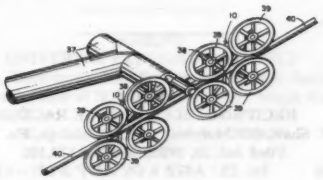
g. respective detonating means for exploding respectively said central charge and substantially immediately thereafter said end charges such that said end charges detonate said intermediate charges and enhance the centrally located explosion to enlarge the fractured area in said subterranean formation and extend said fracture more deeply into said subterranean formation.

4,329,926

BIASED SHEAVE FRAME FOR AERIAL TRAM

Tony R. Sowder, and Douglas A. Sowder, both of E. 814 Grace Ave., Spokane, Wash. 99207

Filed May 13, 1980, Ser. No. 149,443
Int. Cl.³ B61B *12/06*
U.S. Cl. 104—179 **5 Claims**



1. In a compound frame for support of a group of sheaves which in turn support the transiting cable of an aerial tramway with a predetermined safety force between each sheave of the group and the supported transiting cable, the combination comprising:

a body having means for mounting on a supporting structure;

paired, opposed support arms pivotably supported by the body in angular relationship with each other, each support arm having in its outer portion a sheave spindle to mount sheaves to support a transiting cable therebetween;

mechanical biasing means communicating between the support arms to bias them toward each other with a predetermined minimum force; and

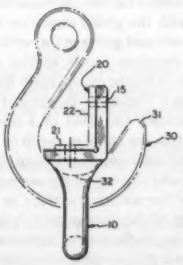
means of limiting the motion of each support arm toward the body.

4,329,927

RAILWAY CAR ROPING STAPLE

Thomas R. Minshull, Greenville, Pa., assignor to Greenville Steel Car, Greenville, Pa.

Filed May 9, 1980, Ser. No. 148,279
Int. Cl.³ A44B *13/00;* B61J *3/10;* B66C *17/26*
U.S. Cl. 105—462 **4 Claims**



1. A roping staple for attachment to an underface of a side sill of a railroad car comprising

a bracket having an upwardly extending flange and a horizontally extending flange,

a D-shaped ring portion having an inverted stirrup shape, said ring portion further comprising a generally horizontal portion having an arcuate inner surface and a generally U-shaped portion having a generally arcuate surface,

an upper surface of the horizontal portion of said ring portion being attached to the horizontal flange of the bracket for transmitting a lifting force to the side sill.

4. A roping staple permanently attached to an underface of a side sill of a railroad car comprising

A D-shaped ring being an inverted stirrup shape, said ring further comprising a generally horizontal portion having an arcuate inner surface and a generally U-shaped portion having a generally arcuate surface, said horizontal portion having a flat upper surface secured as by welding to the undeface of a side sill for transmitting a lifting force to the side sill.

4,329,928

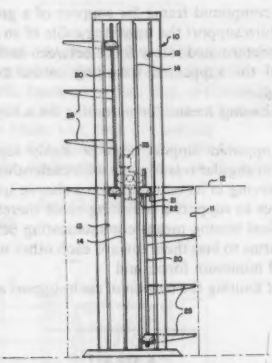
RECIPROCABLE STORAGE RACKS

Alvin W. Shaw, 803 Maryland Ave., Pittsburgh, Pa. 15232

Filed Jul. 28, 1980, Ser. No. 173,103

Int. Cl.³ A47B *9/06*; A47F *3/08*

U.S. Cl. 108—106 **4 Claims**



1. A vertically reciprocable storage rack assembly comprising a vertical main frame, guide means adjacent each side edge of said frame, vertical storage rack frames, each having a length substantially half the length of the main frame on two opposite sides of said main frame; guide means on each of said storage rack frames on two opposite sides of said main frame cooperating with the guide means on the main frame to support and maintain said guide in the vertical position throughout the length of the main frame, spaced shelves on said storage rack frame, drive means on the main frame drivingly engaging said storage rack frame for movement vertically thereon and well means beneath the level of a selected working surface, said well means being equal in depth to substantially the length of the storage rack frame, said main frame being mounted in said well whereby the top of the storage frame is substantially at the level of the working surface in its lowermost position and the bottom of the storage rack frame is substantially level with the working surface at its uppermost positions, said drive means includes a geared rack on each storage rack frame, each in driving engagement with a drive gear on opposite sides of a main drive gear whereby said racks are driven in opposite directions when the main drive gear rotates.

4,329,929

WET DEASHER

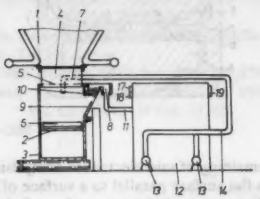
Bruno Jessen, Hamburg, Fed. Rep. of Germany, assignor to Deutsche Babcock Aktiengesellschaft, Oberhausen, Fed. Rep. of Germany

Filed Oct. 20, 1980, Ser. No. 199,104

Claims priority, application Fed. Rep. of Germany, Jan. 11, 1980, 300791

Int. Cl.³ F23J *1/02*

U.S. Cl. 110—171 **5 Claims**



1. A wet deasher comprising: a trough filled with quench water and arranged underneath an ash hopper of a boiler; said trough having a quench water feed and overflow means; ash conveying means in said trough; cooling means arranged between said overflow means and said quench water feed; pump means for circulating quench water permanently through said cooling means; at least one pack of oblique parallel plates arranged within said trough before the overflow; said cooling means having heat exchanger tubes divided into sections swept successively by the quench water; a pump upstream tank preceding said pump means for receiving said heat exchanger tubes; said pump upstream tank having a bottom obliquely arranged and converging to an outlet opening.

4,329,930

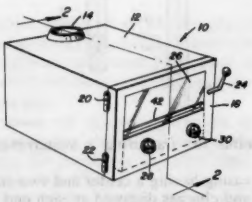
DRAFT AIR DEFLECTING DEVICE

James E. Riley, Sparks, Nev., assignor to Alpine Manufacturing Company, Inc., Sparks, Nev.

Filed Aug. 6, 1980, Ser. No. 175,856

Int. Cl.³ F23M *7/00*

U.S. Cl. 110—175 R **13 Claims**



1. A draft air deflecting device for use in combination with a firebox having a window therein, said draft air deflecting device comprising:

air chamber means for collecting a supply of draft air therein being ultimately suppliable to a combustion process occurring in said firebox;

nozzle means for directing said supply of draft air from said air chamber means across an interior surface of said window thereby to cool and clean said window prior to use of said draft air in said combustion process; and

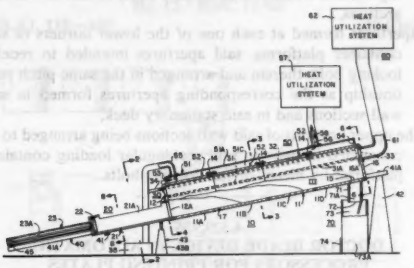
at least one draft air inlet aperture communicating with said air chamber means whereby draft air may be directed from an exterior area into said air chamber means for collection therein, said air chamber means being essentially a box-like structure in sealing engagement with said interior portion of said firebox and said nozzle means being fixedly attached to said box-like structure and con-

toured as a forwardly extending lip having an open portion through which said draft air is directed upon being emitted from said air chamber means.

4,329,931
BURNING SYSTEM AND METHOD

Robert E. Burton, 23881 Sherwood Rd., Willits, Calif. 95490

Filed Feb. 14, 1980, Ser. No. 121,536
Int. Cl.³ F23G 5/12
U.S. Cl. 110—346 22 Claims



1. A substantially smokeless burning system comprising:

an elongated burning chamber having a front, fuel entry end with a fuel entry port located substantially adjacent the bottom of said chamber and a rear, combustion gas exit end;

support means for supporting said burning chamber in a generally horizontal orientation with a predetermined slight degree of upward tilt from front to rear;

feeding means for pushing an elongated volume of new fuel into said fuel entry port thereby pushing already burning fuel generally toward said rear end of said burning chamber to establish a fuel drying zone extending across a lower front portion of said chamber, a volatile burning zone adjacent to and substantially overlying said fuel drying zone in a generally lower central portion of said chamber, and a charcoal burning zone in a generally lower rear portion of said chamber adjacent to and substantially overlying said volatile burning zone; and

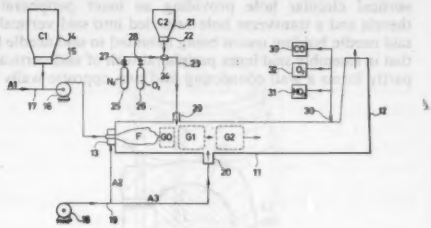
air delivery means for supplying air to the interior of said chamber at a plurality of locations across at least substantially the total length of said chamber; whereby incomplete combustion products from said volatile burning zone pass through and across said charcoal burning zone and are substantially completely burned in said charcoal burning zone before exiting at said rear end of said burning chamber.

4,329,932
METHOD OF BURNING FUEL WITH LOWERED NITROGEN-OXIDES EMISSION

Yasuro Takahashi, and Masayasu Sakai, both of Nagasaki, Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 3, 1980, Ser. No. 156,092
Claims priority, application Japan, Jun. 7, 1979, 54/71466
Int. Cl.³ F23D 1/00
U.S. Cl. 110—347 8 Claims

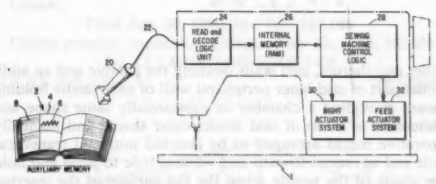
1. A method of burning fuel with a lower emission of nitrogen oxides, which comprises feeding initial pulverized solid fuel and initial air for combustion to the main burner in a combustion furnace and feeding additional pulverized solid fuel to the region of said furnace where the combustion of the initial fuel is about to conclude, said additional fuel being conveyed by means of an inert gas having from 0 to about 10% oxygen admixed, which conveying gas enters the furnace with the additional fuel.



4,329,933
UNIVERSAL EXPANSION MODULE

Howard L. Beckerman, Middletown, and Robert Sedlatschek, Bridgewater, both of N.J., assignors to The Singer Company, Stamford, Conn.

Filed Jun. 22, 1981, Ser. No. 276,430
Int. Cl.³ D05B 3/02
U.S. Cl. 112—158 E 6 Claims



1. In combination with an electronically controlled sewing machine having stitch forming instrumentalities for sewing stitch patterns, an electronic memory means for storing stitch pattern data, and control means influenced by said stitch pattern data stored in said memory means for effecting and regulating movement of at least one of said stitch forming instrumentalities, the improvement comprising:

a. auxiliary memory means including a sheet having a machine readable code carried thereby related to a predetermined stitch pattern together with a graphic representation of that stitch pattern,

b. reader means for sensing said code carried by said auxiliary memory means, and

c. logic means for converting said code sensed by said reader means into stitch pattern data and for storing said stitch pattern data in said electronic memory means.

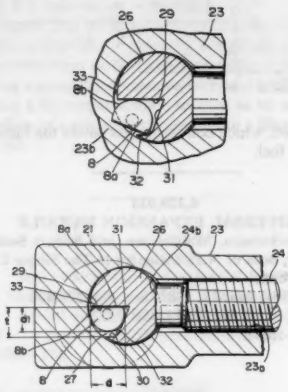
4,329,934
NEEDLE HOLDING DEVICE FOR SEWING MACHINES

Susumu Hanyu, Hachioji, and Takao Oshima, Gyoda, both of Japan, assignors to Janome Sewing Machine Co., Ltd., Tokyo, Japan

Filed Mar. 5, 1980, Ser. No. 127,403
Claims priority, application Japan, Mar. 10, 1979, 54-31164
Int. Cl.³ D05B 55/02
U.S. Cl. 112—226 9 Claims

1. A needle holding device for a sewing machine of the type having a needle with a shank of substantially semi-circular shape with a cut out edge to define a flat surface thereon, comprising a needle bar for supporting said needle, said needle bar being formed with a vertically extended groove projecting a predetermined distance from a lower end thereof, said vertically extended groove being defined by at least two opposite

walls spaced from each other and extending in parallel with each other and by an angular wall connecting said opposite walls at one end thereof; needle holding means formed with a vertical circular hole providing an inner peripheral wall therein and a transverse hole extended into said vertical hole, said needle holding means being mounted to said needle bar so that in assembly said inner peripheral wall of said vertical hole partly forms a wall connecting said two opposite walls at the



other end thereof, said walls defining the groove and an additional part of said inner peripheral wall of said needle holding means providing a chamber of substantially same shape and dimension as those of said semicircular shank; and manually operative means arranged to be inserted into said transverse hole and advanced toward said vertical hole to press and hold the shank of the needle when the flat surface of the inserted shank is positioned against one of said opposite walls of said groove.

4,329,935

ARRANGEMENT IN MOUNTING SUPPLEMENTARY DECKS IN SHIPS

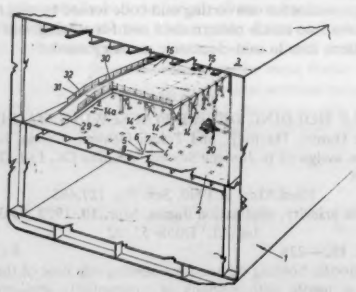
Bo E. Jonasson, Västra Frölunda, Sweden, assignor to von Tell AB, Molndal, Sweden

Filed Jun. 17, 1980, Ser. No. 160,192

Claims priority, application Sweden, Aug. 20, 1979, 7906918

Int. Cl.³ B63B *25/18*

U.S. Cl. 114—72 **5 Claims**



1. An improved device in mounting supplementary decks between existing decks in ships of the kind built for loading container transport, at least one of the existing decks of said ship formed with apertures, arranged in groups of four and positioned in equal pitch relationship, said apertures adapted to receive locking bolts therein of the kind known as twist locks, said bolts serving to removably secure the loading containers to said deck, the improvement comprising

a number of wall sections,

horizontal flanges arranged at the top as well as at the bottom of each wall section,

apertures formed in said flanges for passage therethrough of said locking bolts, said apertures being arranged in groups of four and disposed in the same pitch relationship as the apertures formed in said stationary deck,

rectangular loading container platforms, said platforms having a width which is substantially equal to that of said wall sections,

apertures formed at each one of the lower corners of said container platforms, said apertures intended to receive locking bolts therein and arranged in the same pitch relationship as the corresponding apertures formed in said wall sections and in said stationary deck,

the upper portions of said wall sections being arranged to be connected in pairs to said rectangular loading container platforms by means of said locking bolts.

4,329,936

DOCTOR BLADE DEVICE IN AUTOMATIC PROCESSORS FOR PRINTING PLATES

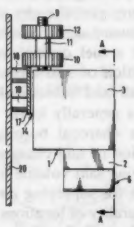
Hans Heist, and Dieter Töpfer, both of Wiesbaden, Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Continuation of Ser. No. 970,155, Dec. 18, 1978, abandoned. This application Dec. 19, 1980, Ser. No. 218,385

Claims priority, application Fed. Rep. of Germany, Dec. 21, 1977, 2756932

Int. Cl.³ B05C *11/02*

U.S. Cl. 118—100 **4 Claims**



1. In a doctor blade device in an automatic processor for printing plates, comprising at least one doctor blade made of a flexible material and being detachably mounted in a guide bar, and holding means for attaching the doctor blade to two side plates of the printing plate processor,

the improvement comprising an integral guide bar and carrier bar each end of which is adapted to be inserted from above into a rectangular channel section having an upwardly pointing opening and having two arms spaced by a web,

means securing each channel section by its web to a side plate in such a manner that its two arms extend transversely to the transport direction of a printing plate in the direction of the interior of the printing plate processor,

support means at both ends of the upper surface of the carrier bar whereby the carrier bar together with the integral guide bar and the doctor blade rest upon said channel sections,

means adjustably mounting the support means on the carrier bar, whereby the distribution of the weight exerted by the carrier bar together with the guide bar and the doctor blade on the one hand, upon the line of contact of the

doctor blade of the printing plate, and, on the other hand, upon the two channel sections in regulatable, and

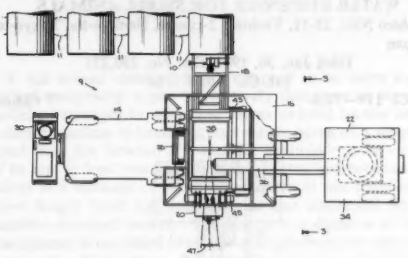
wherein said support means includes a first knurled nut at each end of the carrier bar, which is screwed on a threaded bolt inserted in the carrier bar and which is locked by a second knurled nut.

4,329,937

PIPE LINING APPARATUS

Henry A. N. Holland, Houston, Tex., assignor to Raymond International Builders, Inc., Houston, Tex.

Filed Mar. 18, 1981, Ser. No. 244,870
Int. Cl.[3] B05C *11/02*
U.S. Cl. 118—105 19 Claims



1. A pipe lining apparatus for successively lining several lengths of pipe, said apparatus comprising:

a pipe lining vehicle constructed to move longitudinally inside said pipes, said vehicle including support elements which ride along the inner surface of the pipe and a distributor arranged to receive pipe liner fluid and to distribute the fluid onto the inner surface of the pipe as the vehicle moves through the pipe;

a cradle having surfaces corresponding to portions of the pipe surface to receive said vehicle as it exits from each pipe upon completion of lining of the pipe; and

a cradle positioning apparatus for successively positioning said cradle, with said vehicle mounted thereon, such that said support surfaces are brought into alignment with the ends of said pipes, said cradle apparatus comprising a second vehicle moveable in a given direction from one pipe to the next and a carriage on the second vehicle supporting said cradle, said carriage including first actuators for moving the cradle on the second vehicle in said direction to position said first vehicle accurately.

4,329,938

EVAPORATOR TOOL WITH REMOTE SUBSTRATE REORIENTATION MECHANISM

Guenter H. Mang, Vista, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

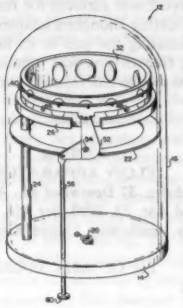
Filed Oct. 3, 1980, Ser. No. 193,868
Int. Cl.[3] C23C *13/08*
U.S. Cl. 118—730 13 Claims

1. An evaporator mechanism comprising:

a housing forming a vacuum chamber;

first means situated within said housing for securing at least one substrate within said vacuum chamber, said first means comprising a support member, a holding ring connected to said support member, and a substrate clamp secured to said holding ring for securing said at least one substrate;

second means connected to said first means and extending to the exterior of said housing for enabling rotation of said substrate from the exterior of said housing, said second means comprising a movable ring adjacent to said holding ring, a cam mechanism connected to said movable ring,



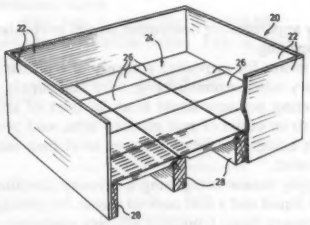
and a connecting rod connected to said cam mechanism and extending to the exterior of said housing.

4,329,939

FLOORING UNIT

Thomas D. Christie, Calgary, Canada; Robert K. Ballantine, Mullalloo Perth, Australia, and Pierre A. Moreau, Calgary, Canada, assignors to BCM Manufacturing Ltd., Calgary, Canada

Filed Jun. 30, 1980, Ser. No. 164,196
Claims priority, application Canada, May 22, 1980, 352499
Int. Cl.[3] A01K *1/00;* E04B *5/06*
U.S. Cl. 119—28 10 Claims



10. An animal enclosure having a floor surface formed by an assembly of modular, rectangular flooring units individually removably supported on a plurality of parallel beams, the units being disposed in parallel rows with the units in each row in abutting side by side relationship with adjacent units in the same row and abutting end to end relationship with the units of an adjacent row, each unit being supported adjacent opposite ends thereof on adjacent ones of said beams with a common beam supporting the opposed ends of the units in two adjacent rows, each said unit comprising a unitary moulding in a plastic material which has relatively high heat insulating properties and which is substantially uneffected by animal droppings, the moulding defining a tread surface and a plurality of reinforcing webs which extend downwardly below said tread surface and which include a series of spaced parallel webs extending in a longitudinal direction of the unit and from end to end thereof, and at least one web which is integrally coupled to and extends generally normally with respect to said parallel webs, wherein said tread surface is formed with a plurality of openings which extend through the moulding at positions displaced from the positions of said webs so that animal droppings can pass through the mouldings when the unit is in use, and wherein said longitudinal webs are shaped to define portions adjacent respectively opposite ends of the unit which are of reduced

depth compared with the remainder of said webs, said portions extending inwardly over a predetermined distance corresponding substantially to half the width of said common beam and defining respective lower surfaces for resting on a said beam, and respective locating shoulders adapted to co-operate with said beams for locating the unit in its longitudinal direction, said units being free of physical attachment to said beams whereby the units can be individually removed by lifting from the beams.

4,329,940

FLOW APPARATUS

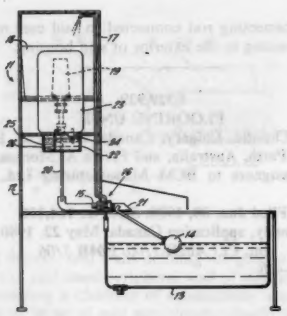
Walter R. Humphries, 32 Desswood Pl., Aberdeen, Scotland

Filed Apr. 22, 1980, Ser. No. 142,820

Claims priority, application United Kingdom, Jul. 10, 1979, 7923945

Int. Cl.³ A01K *39/024*

U.S. Cl. 119—72 **31 Claims**



1. Flow apparatus for combining liquids in constant proportions comprising:

supply means for providing a supply of a primary liquid;

a primary tube communicating with said supply means for delivering primary liquid from an inlet of said primary tube to an outlet of said primary tube, said primary tube outlet being situated at a lower level than said primary tube inlet;

said supply means comprising a primary container for primary liquid and a first control means for passing a charge of primary liquid from said primary container down said primary tube, said control means being arranged to operate whenever the level of primary liquid in the primary container rises above a predetermined level;

a container for a secondary liquid;

a secondary tube leading from an inlet thereof which communicates with said secondary liquid container to a junction of said secondary tube with said primary tube for sucking secondary liquid from said secondary liquid container into said primary tube upon flow of said primary liquid through said primary tube;

said junction being situated between said upper inlet of said primary tube and said lower outlet of said primary tube, and at a level higher than said inlet of said secondary tube; said primary tube and said secondary tube being arranged such that, in the absence of flow of primary liquid in said primary tube, said primary and secondary tubes are both empty in the region of said junction and between said junction and said outlet of said primary tube; and said supply means being arranged to pass primary liquid down said primary tube in such a manner that the rate of flow of primary liquid past said junction is less than that required to cause any substantial velocity-related entrainment effect, and said secondary liquid is sucked into said primary tube substantially by the effect of displacement of the liquid in said primary tube below said junction;

a third container for receiving the mixture of primary and secondary liquids from the outlet of said primary tube; and

further control means for passing a flow of primary liquid from a source of primary liquid to said primary container whenever the level of liquid in said third container falls below a predetermined level, said further control means being arranged to continue to pass primary liquid to said primary container until said first mentioned control means passes sufficient primary liquid down said primary tube to restore the level of said third container above said minimum level.

4,329,941

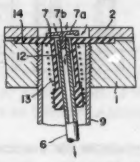
WATER DISPENSER FOR SMALL ANIMALS

Motohiro Niki, 22-11, Yushima 2-chome, Bunkyo-ku, Tokyo-to, Japan

Filed Jan. 30, 1981, Ser. No. 230,221

Int. Cl.³ A01K *7/06*

U.S. Cl. 119—72.5 **7 Claims**



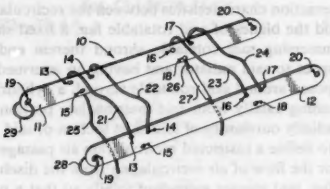
1. A water dispenser for feeding small animals having upstream and downstream directions and comprising: a casing supplied with water and having a water outlet at its downstream part; an elastic valve seat sealingly secured in said water outlet and having an upstream planar surface; a poppet valve having a valve surface normally engaging said planar surface in a water-tight manner; a feed tube secured at its upstream end to said poppet valve and extending downstream through said valve seat away from said casing, whereby when said feed tube is inclined by a nudging force applied by a small animal to the downstream end of said tube, said poppet valve is also inclined relative to said valve seat to allow the water in the casing to flow downstream through a gap formed between said valve seat and said poppet valve; means forming an annular water receiving space for temporarily receiving therein the water which has flowed through said gap; aperture means formed through said feed tube to conduct the water in said water receiving space into the interior of said feed tube to cause the water to flow downstream therein, said valve seat comprising an annular flange providing said planar surface and a cylindrical portion which is open at an upstream end and terminates at a downstream end wall, said feed tube extending downstream through the interior of said cylindrical portion with an annular space interposed therebetween and forming said water receiving space, said feed tube extending further downstream through a tight hole in said end wall, whereby water cannot leak between said feed tube and said end wall, said aperture means being formed in the part of the feed tube located in said cylindrical portion and a position upstream and remote from said end wall; and a coil spring fitted in compressed state encompassingly about said cylindrical portion and reinforcingly supporting from outside said cylindrical portion of the valve seat, the cylindrical portion having a downstream end wall part of enlarged outer diameter, forming an annular shoulder against which a portion of said coil spring abuts, the portion of the coil spring, adjacent to said annular flange, being in abutment with the annular flange whereby an axial tension is exerted to the cylindrical portion by the coil spring

4,329,942

ANIMAL RESTRAINT DEVICE

Willis T. King, 5137 Boonville Hwy., Evansville, Ind. 47715

Filed Feb. 17, 1981, Ser. No. 235,047
Int. Cl.³ A01K 29/00, 15/04
U.S. Cl. 119—96 6 Claims



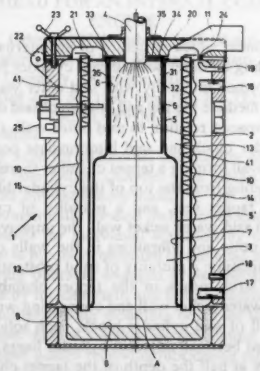
1. An animal restraint device adapted to be worn by the animal comprising: a pair of relatively thin, narrow staves of sufficient strength to withstand forces exerted by the animal without bending or breaking, said staves being of a length to reach from just forward of the animal's shoulder to the vicinity of its hip; at least one harness member attached between said staves at a distance of about one-quarter to one-third of the stave length from one end; at least one additional harness member attached between said staves at a distance of about one-quarter to one-third of the stave length from the other end; a pair of pull members, each attached to one of said stave members in the vicinity of one of said harness members and adapted to be removably affixed to the other stave member in a vicinity of said one of said harness members and means for attaching the forward end of each of said staves to a neck collar worn by said animal whereby lateral spine flexing in said animal is restrained by said device when placed on an animal with the staves positioned along opposite sides of said animal, the forward ends of such staves attached to a neck collar on the animal, the pull members connected between the staves across and partially encircling the animal's body and the harness members completing the encirclement of the animal's body.

4,329,943

HEATING BOILER

Emil Schwörer, Vilters, Switzerland, assignor to Eugen Josef Siegrist, Switzerland

Filed Aug. 19, 1980, Ser. No. 179,561
Claims priority, application Switzerland, Aug. 27, 1979, 7743/79
Int. Cl.³ F22B 7/12
U.S. Cl. 122—17 9 Claims



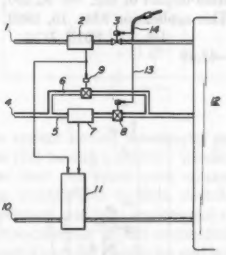
1. A heating boiler comprising an outer housing, a cylindrical fire chamber wall in said housing extending axially from one end thereof and defining therewithin a primary fire chamber, a fuel burner extending into said chamber from said one end of said housing, a cylindrical fire spaced wall portion radially spaced outwardly of said fire chamber wall and extending along the length of said fire chamber wall and having a secondary cylindrical fire space wall portion extending axially beyond the length of said cylindrical fire chamber wall and being of a greater diameter than said fire chamber wall and defining in said secondary portion a secondary fire chamber connected to said primary fire chamber, wall means in said housing spaced radially inwardly of the interior of said housing and defining a chamber water space between said wall means and said fire space wall portion and said secondary fire space wall portion and defining a hot water tank between said wall means and the interior of said housing, gas discharge means including at least one conduit extending through said chamber water space to the exterior of said housing and communicating with the end of said secondary fire chamber which is remote from said primary fire chamber, and a tubular thin walled lining between said fire chamber wall and said fire space wall portion leaving a clearance therebetween which upon a predetermined operating boiler temperature is bridged by said lining.

4,329,944

EXCESS AIR FACTOR CONTROL DEVICE FOR AN ALCOHOL REFORMED GAS ENGINE

Toshio Hirota, Tokyo, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Feb. 4, 1980, Ser. No. 118,080
Claims priority, application Japan, Feb. 5, 1979, 54-11372; Feb. 28, 1979, 54-21875
Int. Cl.³ F02B 43/08
U.S. Cl. 123—3 6 Claims

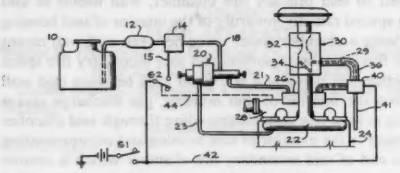


1. An excess air factor control device for an alcohol reformed gas engine, comprising a primary air valve located within a primary air supply passage, operating means for controlling operation of the primary valve, reformed gas supply means for supplying reformed gas to the engine, a secondary air valve located within a secondary air supply passage, alcohol adding means for supplying alcohol to said engine, and a gas flow meter for measuring reformed gas flow rate, said reformed gas supply means being operated in interlocked relation to said primary air valve, said secondary air supply passage being controlled by the reformed gas flow rate measured by said gas flow meter, said alcohol adding means being controlled independent of temperature by said reformed gas flow rate and primary air flow rate measured by the gas flow meter and an air flow meter.

4,329,945
APPARATUS FOR METERING FUEL ADDITIVES TO INTERNAL COMBUSTION ENGINES

Harvey E. Beech, 18564 Clark St., Apt. 20, Tarzana, Calif. 91356, and Richard M. Bird, 4565 Larkwood Ave., Woodland Hills, Calif. 91364

Filed Aug. 11, 1980, Ser. No. 177,062
Int. Cl.[3] F02M 25/02
U.S. Cl. 123—25 B 8 Claims



1. Valve means for metering a liquid fuel additive from a source of pressurized additive to a vaporizer for supplying vaporized additive to the intake manifold of an internal combustion engine, said valve means comprising

structure forming a wall separating the source from the vaporizer and having an elongated aperture of uniform width,

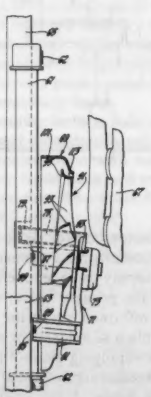
a valve member movable along the length of the aperture in sealed relation to the wall to progressively expose a variable length of the aperture and thereby meter additive to the vaporizer at a rate that is proportional to the valve member movement,

and control means for driving the valve member in its said movement in inverse relation to the absolute value of the vacuum in the intake manifold of the engine.

4,329,946
SHROUD ARRANGEMENT FOR ENGINE COOLING FAN

Richard E. Longhouse, Dayton, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Continuation-in-part of Ser. No. 82,697, Oct. 9, 1979, abandoned. This application Mar. 10, 1980, Ser. No. 128,675
Int. Cl.[3] F01P 7/10
U.S. Cl. 123—41.49 7 Claims

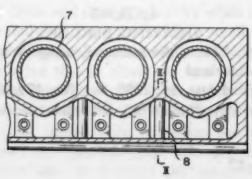


1. In combination an air-cooled radiator, a rotatable fan spaced rearwardly of said radiator, motor means for rotatably driving said fan, said fan having a plurality of radially extended and arcuately spaced fan blades for pumping an airstream through said radiator, a rotatable shroud secured to the outer tips of said blade including cylindrical skirt section disposed around said fan blades and an annular air inlet section extending radially outwardly from a forward portion of said skirt section through a predetermined arc to a terminal outer annular edge of a diameter greater than the diameter of said skirt section and presenting a smooth inlet surface curved and tapering inwardly so that recirculating air remains attached to the walls of said air inlet section to thereby eliminate unsteady flow interaction characteristics between the recirculating flow of air and the blades of said rotatable fan, a fixed shroud entirely immersing said rotatable shroud therein and secured with respect to said radiator and having an intermediate portion disposed around said rotatable shroud, a cylindrical ejector extending axially from said intermediate portion and disposed radially outwardly of said skirt section of said rotatable shroud to define a restricted recirculation air passage therebetween for the flow of air recirculating from the discharge side of said fan, said ejector extending axially so that a portion of the airstream discharged by said fan will be radially directed to partially block said recirculation air passage and thereby limit the quantity of recirculation air entering said inlet section of said rotating shroud to improve the pumping efficiency of said fan while allowing said fan to operate at a low noise level.

4,329,947
CYLINDER BLOCK STRUCTURE OF AN INTERNAL COMBUSTION ENGINE

Akira Ishihara, Oyama, Japan, assignor to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Filed Oct. 5, 1979, Ser. No. 82,086
Claims priority, application Japan, Oct. 5, 1978, 53-136038[U]
Int. Cl.[3] F02F 7/00
U.S. Cl. 123—41.74 3 Claims



1. In a cylinder block structure of an internal combustion engine including an outer wall of said cylinder block, a water jacket wall formed integrally with said outer wall and having portions intermediate the top and bottom of said cylinder block extending in spaced relation to said outer wall, the outer wall of said cylinder block and said intermediate portions of said water jacket wall forming a tappet chamber therebetween with a depth extending from the top of the cylinder block to a wall containing a tappet seat, and a plurality of cylinder liners disposed with said water jacket wall, the improvement for the reduction of noise and vibrations in the walls of said tappet chamber comprising: a plurality of solid substantially cylindrically-shaped strut means in the tappet chamber extending between the water jacket wall and connecting with surfaces of the outer wall of said cylinder block, each solid strut means being provided between adjacent cylinder liners and disposed approximately at half the depth of the tappet chamber where maximum vibration tends to occur when the engine is in operation, whereby noise and vibrations of the cylinder block are significantly reduced.

4,329,948

MULTIPLE PORT CYLINDER FOR CRANKCHAMBER PRECOMPRESSION TYPE TWO STROKE ENGINES

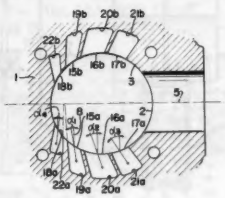
Tetsuzo Fujikawa; Yasuhiro Seto, both of Kobe; Masaru Yamamoto, Hyogo, and Ichiro Tanaka, Akashi, all of Japan, assignors to Kawasaki Jukogyo Kabushiki Kaisha, Hyogo, Japan

Filed Mar. 26, 1980, Ser. No. 134,344

Claims priority, application Japan, Mar. 30, 1979, 54-42820[U]

Int. Cl.³ F02B *33/04*

U.S. Cl. 123—73 AA 5 Claims



1. A multiple port cylinder for a crankchamber precompression type two stroke engine which includes a cylinder wall provided with intake port means and exhaust port means located at diametrically opposite portions along a longitudinal plane containing a longitudinal center line of the cylinder, a first group of three main scavenging ports formed in the cylinder wall at one side of the longitudinal plane, a second group of three main scavenging ports formed in the cylinder wall and symmetrical to the ports in the first group with respect to the longitudinal plane, a pair of auxiliary scavenging ports formed in the cylinder wall at a side opposite to the exhaust port means and symmetrical with each other with respect to the longitudinal plane, said main and auxiliary scavenging ports being connected respectively with mutually separated main and auxiliary scavenging passages which are oriented so that in a cross-section perpendicular to the longitudinal center line scavenging flows from the auxiliary scavenging ports do not substantially intersect with scavenging flows from the main scavenging ports before they reach the longitudinal plane, said auxiliary scavenging passages being oriented in the vicinity of the auxiliary scavenging ports further upwardly than the main scavenging passages.

4,329,949

CYLINDER HEAD FOR AN INTERNAL-COMBUSTION ENGINE

Manfred Abts, Odenthal-Hahnenberg, and Dieter Urban, Pulheim-Sinnersdorf, both of Fed. Rep. of Germany, assignors to Ford Motor Company, Dearborn, Mich.

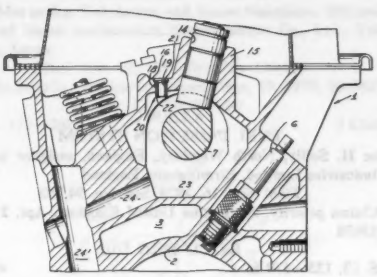
Filed Jun. 30, 1980, Ser. No. 164,722

Int. Cl.³ F01M *9/10*

U.S. Cl. 123—90.34 6 Claims

1. A cylinder head for an internal combustion engine having a dome-shaped combustion chamber with intake and exhaust valves arranged approximately radial to the surface of the chamber and symetrically located on opposite sides of a single overhead camshaft for individual actuation by one end of a rocker arm that is pivotally mounted to the head by a stud, the rocker arm being operably engaged at its opposite end by a tappet movable by the camshaft, and bridge members spanning the camshaft and providing mounting bores for the studs, and providing tappet guides slidably accomodating the tappets therein, the tappet guides receiving lubricating oil therein that is exuded from the guides during movement of the tappet by the camshaft, characterized by,

an oil collecting basin adjacent a tappet guide for collecting oil exuded therefrom, the basin having a discharge hole



therein vertically aligned with a portion of a cam on the camshaft so as to drip oil on the cam to lubricate the cam.

4,329,950

MAGNETO IGNITION SYSTEM WITH INCREASED SPARK ENERGY

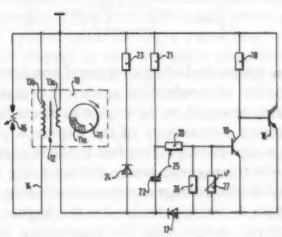
Josef Orova, Schwabach, and Jiri Podrapsky, Buchschwabach, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Continuation of Ser. No. 81,770, Oct. 4, 1979, abandoned. This application May 20, 1981, Ser. No. 265,592

Claims priority, application Fed. Rep. of Germany, Nov. 25, 1978, 2851097

Int. Cl.³ F02P *3/06;* H05B *37/02*

U.S. Cl. 123—149 C 5 Claims



1. In an ignition system having a magneto generator (10) having an armature (12) having a primary winding and a secondary winding, at least one spark plug connected to said secondary winding, controllable ignition switch means (16) connected to said primary winding, and control switch means (19) having an emitter-collector circuit connected to said ignition switch means and a base for switching said ignition switch means from a first state allowing current flow through said primary winding to a second state blocking said current flow at the ignition time, the improvement comprising

a capacitor (22) having a first and second terminal;

a charging resistor (21) connected to said first terminal;

means for connecting the so-formed series circuit to said primary winding;

coupling resistor (20) having a first terminal connected to said first terminal of said capacitor and a second terminal connected to said base of said control switch means; and

a balance or trim resistor (26) having a first terminal connected to said emitter and a second terminal connected to said second terminal of said coupling resistor, said capacitor and said coupling resistor together having a time constant ($T=R\times c$) exceeding 10 microseconds but creating a spark having a duration of not less than 300 microseconds

by constant recharging of said capacitor during said discharge time through said charging resistor.

4,329,951

FUEL INJECTION SYSTEM

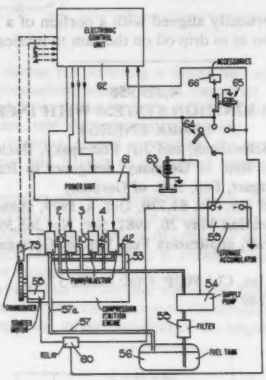
Alec H. Seilly, North Wembley, England, assignor to Lucas Industries Limited, Birmingham, England

Filed Nov. 16, 1979, Ser. No. 94,903

Claims priority, application United Kingdom, Apr. 21, 1979, 7913938

Int. Cl.³ F02D 5/02

U.S. Cl. 123—179 L 4 Claims



1. An engine system including an internal combustion engine having a plurality of combustion spaces, a plurality of fuel injection nozzles mounted on the engine to direct fuel into the combustion spaces respectively of the engine, a plurality of fuel injection pumps for supplying fuel to the injection nozzles respectively, electromagnetic means for actuating the pumps respectively each electromagnetic means including a solenoid and an armature, a starting motor for the engine, a storage battery, a delayed action relay for connecting the starting motor to the storage battery to achieve cranking of the engine, a manually operable switch movable from an off position to a first position and from the first position to a second position, a first contact on said switch which is connected to said battery in the first and second positions of said switch, a second contact on said switch which is connected to said battery in the second position of the switch, said second contact being connected to said delayed action relay whereby the starting motor will be rendered operative when the switch is moved to said second position and after the delay period of the relay, an electronic control unit which controls the supply of current to said solenoids so that the solenoids are energized in timed relationship with the engine, said control unit being connected to said first contact of the switch so that it is energized in the first and second positions of the switch, a first input to said control unit from said second contact, first circuit means in said control unit for energizing said solenoids when said switch is initially moved to said second position, second circuit means in said control unit for ensuring reduced displacement of the fuel injection pumps when said switch is moved to said second position, and third circuit means in said control unit for ensuring multioperation of said injection pumps to achieve the required volume of fuel for starting the engine.

4,329,952

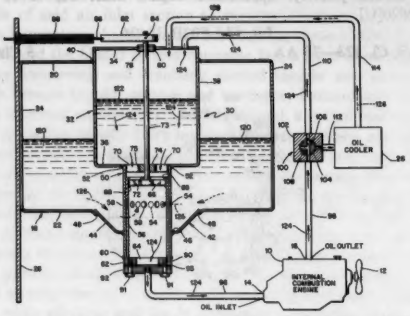
OIL CONTROL SYSTEM FOR PISTON-TYPE AIRPLANE ENGINES

Vincent S. Buraas, Box 176, Northwood, N. Dak. 58267

Filed Jan. 21, 1980, Ser. No. 113,491

Int. Cl.³ F01M 1/00

U.S. Cl. 123—196 AB 10 Claims



1. In combination with an internal combustion engine having an oil inlet and an oil outlet, a main oil tank, and valve means associated with said tank for passing oil from said oil outlet directly to said oil inlet in a first selected position of said valve means without mixing said oil from said oil outlet with oil from said main tank, and for mixing oil from said oil outlet with oil from said main tank in a second selected position of said valve means.

4,329,953

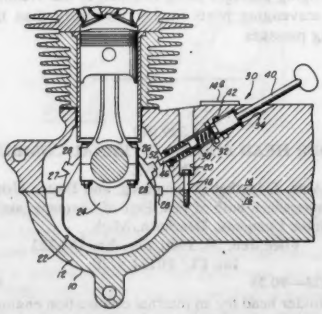
MOTORCYCLE ANTITHEFT SYSTEM

Jon D. Row, Huntington Beach, Calif., assignor to American Honda Motor Co., Inc., Gardena, Calif.

Filed Aug. 29, 1980, Ser. No. 182,495

Int. Cl.³ B62H 5/08

U.S. Cl. 123—198 B 4 Claims



1. In a motorcycle having a crankshaft positioned in a crankcase wherein said crankcase comprises a body having at least two parts and closing means accessible from one direction operable to hold said parts together, a motorcycle antitheft system comprising a bore formed in said crankcase body extending toward said crankshaft through the line of access to said closing means, a plunger movable along the axis of said bore between an unlocked position and a locked position wherein access to said closing means is blocked, locking means operable to alternately maintain said plunger in either said locked or said unlocked position and means on said crankshaft

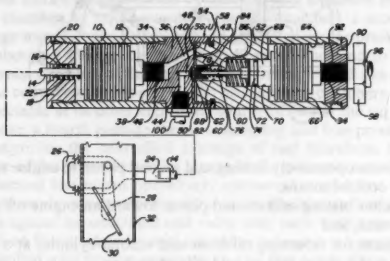
operable to engage said plunger in said locked position to thereby prevent rotation of said crankshaft.

4,329,954

ENGINE SHUT-DOWN DEVICE

Odis L. Dobbs, 5840 Dahlia St., Commerce City, Colo. 80022

Filed Apr. 14, 1980, Ser. No. 139,983
Int. Cl.³ F02B 77/08
U.S. Cl. 123—198 D 2 Claims



1. A modular pressure responsive unit for use in an engine shut-down device and which is responsive to engine oil pressure and fuel pressure, wherein the engine is shut down when the pressure responsive unit senses a drop in engine oil pressure below a predetermined limit, said modular unit comprising:

a tubular power end section;

a first bellows mounted in said power end section and expandable in response to fuel pressure;

a power end cap removably connected to one end of said power end section and having a central opening therein;

a push rod extending through said power end cap and having a first end connected to said first bellows and a second end connectable to the engine shut-down device, said push rod being movable in response to movement of said first bellows;

means in said power end section normally maintaining said first bellows in collapsed condition;

a mid-section having one end removably connected to the opposite end of said power section, having a fuel pressure inlet in one side thereof in fluid communication with a valve seal in a face on the opposite end of said mid-section and a passageway in fluid communication with said first bellows and said opposite end of said mid-section;

tubular oil section having one end removably connected to said other end of said mid-section and having a face spaced from the face of said mid-section;

a second bellows mounted in said oil section and expandable in response to oil pressure;

a pressure valve connected to said second bellows and movable therewith to normally bring said valve into engagement with said valve seat;

an oil end cap removably connected to the opposite end of said oil section having an oil pressure inlet therein in fluid communication with said second bellows normally urging said pressure valve into closed position against said valve seat; and

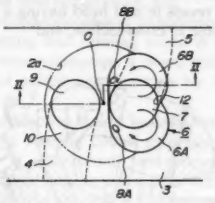
means urging said second bellows toward a collapsed position in response to a drop in oil pressure below a predetermined amount to open said pressure valve allowing fluid pressure to flow through the spaces between said faces and expand said first bellows to move said push-rod to shut down the engine.

4,329,955

COMBUSTION CHAMBER OF AN INTERNAL COMBUSTION ENGINE

Shigeo Muranaka, Yokohama, and Yasuo Nakajima, Yokosuka, both of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Mar. 13, 1980, Ser. No. 129,865
Claims priority, application Japan, Mar. 19, 1979, 54-34257
Int. Cl.³ F02B 3/00
U.S. Cl. 123—260 5 Claims



1. A combustion chamber of an internal combustion engine having a piston and a cylinder head, said combustion chamber comprising: a plenum chamber having a substantially B-shaped cross-section when viewed in plan, said plenum chamber being formed by two smaller contiguous plenum chambers which have at their juncture an inwardly extending wedge-like plenum chamber wall projection which is located substantially along a center transverse plane extending through said B-shaped plenum chamber, an exhaust valve having a valve head located adjacent said projection, two spark plugs flanking said exhaust valve on a side of said plenum chamber opposite to said wall projection, said exhaust valve head being bounded by said wall projection and said side wall opposite said wall projection, an intake valve having a valve head symmetrically located with respect to said two spark plugs and located diametrically across from said exhaust valve head with respect to cylinder head, the cylinder head having a lower, substantially flat, non-plenum surface forming a squish surface, a groove formed in at least one of said squish surface and the opposing upper surface of the piston, said groove communicating between said squish surface and the proximity of said wedge-like plenum chamber wall projection to carry the fuel-air mixture during the compression stroke towards said wall projection.

4,329,956

DIESEL CYCLE ENGINE HAVING A PRECOMBUSTION CHAMBER

Antonio Burgio, Moncalieri, Italy, assignor to Fiat Auto S.p.A., Turin, Italy

Continuation of Ser. No. 930,120, Aug. 1, 1978, abandoned. This application Feb. 13, 1980, Ser. No. 121,195
Claims priority, application Italy, Sep. 23, 1977, 69100 A/77
Int. Cl.³ F02B 19/10
U.S. Cl. 123—286 1 Claim

1. In a diesel cycle internal combustion engine of the type having:

at least one cylinder,

a cylinder head,

a metal insert in said cylinder head,

means defining a cavity in said metal insert in said cylinder head, said cavity constituting a precombustion chamber for said engine,

a fuel injector, said fuel injector extending into said metal insert in said cylinder head and closing said cavity from above,

the improvement wherein said precombustion chamber is formed in two parts,

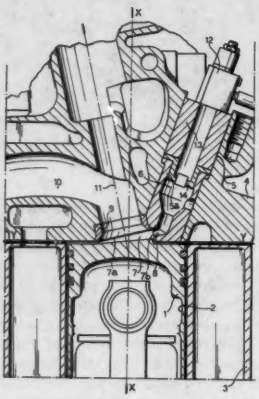
means defining a first part of said precombustion chamber

being of substantially cylindrical form and having a frustoconical portion at the downstream end thereof,

means defining the second part of said precombustion chamber also being of substantially cylindrical form wherein the volume of said first part of said precombustion chamber constitutes 85% of the overall volume of said precombustion chamber, and the volume of said second part represents the remaining 15% of this overall volume,

said first and said second parts of said precombustion chamber communicating with one another through said frustoconical portion at the downstream end of said first part,

a combustion recess in said head having a substantially triangular profile in cross-section, and



means defining a single duct for the discharge of gases produced as a result of combustion in said precombustion chamber, said duct communicating the end of said recess having the greatest cross-section with the end of the said second part of said precombustion chamber opposite to the said first part thereof and having an inclination in the region of 120° with respect to the longitudinal axis of said cylindrical first and second parts of said precombustion chamber, said cylindrical parts being coaxial with one another and said metal insert has a hole in the side wall thereof at a position substantially midway of the axial length of said first part of said precombustion chamber adapted to receive a glowplug, the said hole having its longitudinal axis directed perpendicularly to the longitudinal axis of said first part of said precombustion chamber.

4,329,957

ENGINE CONTROL

Robert K. Havemann, Bloomington, Minn., assignor to Thermo King Corporation, Minneapolis, Minn.

Filed Oct. 15, 1980, Ser. No. 197,379

Int. Cl.³ F02D *35/02*

U.S. Cl. 123—378 **6 Claims**

6. A speed control and loss of oil pressure control arrangement for an internal combustion engine having a pressurized oil system, comprising:

first and second axially aligned cylinders with a piston in each, said first piston operating from an engine off position to an engine low speed position upon receiving engine oil pressure in said first cylinder;

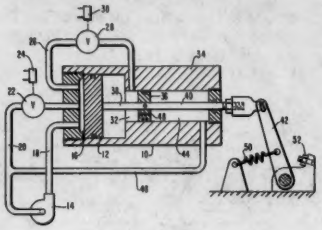
an oil return line connected to said first cylinder;

valve means for closing said oil return line upon initiating engine operation so as to pressurize said first cylinder and move said first piston to said engine low speed position;

means for pushing said second piston from an engine off position to an engine low speed position by said first piston in corresponding movement;

a conduit from said first cylinder to said second cylinder for the flow oil therethrough;

valve means preventing oil flow through said conduit under engine off and engine low speed conditions, and permitting oil flow under a demand for engine high speed to cause said second piston to move away from said first piston to an engine high speed position;



means operatively linking said second piston to engine speed control means;

means biasing said second piston toward an engine off position; and

means for returning oil from said second cylinder at a control leakage rate to said oil return line.

4,329,958

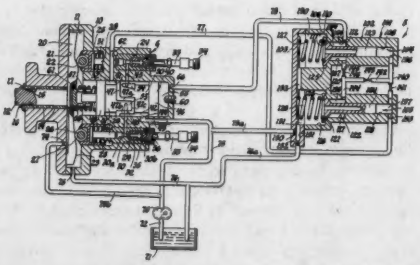
DIESEL FUEL PUMP HYDRAULIC GOVERNOR CONTROL MECHANISM

Thomas J. Wich, Grand Rapids, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Nov. 28, 1980, Ser. No. 211,055

Int. Cl.³ F02D *7/00*

U.S. Cl. 123—387 **3 Claims**



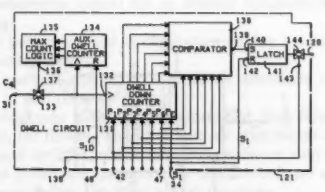
1. A hydraulic governor control mechanism for supplying fluid at a regulated governing pressure to an engine driven fuel injection pump of the type that is supplied with fuel at a predetermined supply pressure and in which an array of cylinder injection pumps are driven by a cam, and wherein a landed control valve, slidable and rotatable in a control sleeve, is used to control the quantity of fuel supplied to each injector and to the hydraulic governor control mechanism and which forms therewith a governor chamber; said hydraulic governor control mechanism including a housing means having first and second stepped cylinders therein; each said stepped cylinder including an annular valve seat adjacent one end thereof; first and second servo valves in said first and second stepped cylinders, respectively, each of said servo valves including a stem slidably received in a reduced diameter portion of its associated stepped cylinder and a poppet type valve head loosely received in an enlarged diameter portion and which is adapted for seating engagement against its associated said valve seat; said first servo valve forming with said first stepped cylinder a

bias pressure chamber at its head end, a regulated pressure chamber intermediate its ends and an advance pressure chamber at its opposite end; said second servo valve forming with said second stepped cylinder a bias pressure chamber at the free end of its head, a governor pressure chamber intermediate its ends and a control pressure chamber at its opposite end; a first passage means in said housing means connected at one end to said advance pressure chamber and adapted to be connected at its other end to a source of pressurized fuel as supplied by the injection pumps of the fuel injection pump; a first flow control orifice passage means connecting said advance pressure chamber to said control pressure chamber; a second flow control orifice passage means connecting said control pressure chamber to said regulated pressure chamber; a third flow control orifice passage means connecting said regulated pressure chamber to said governor pressure chamber; a second passage means connected at one end to said governor pressure chamber and adapted to be connected at its other end to the governor chamber of the fuel injection pump; a third passage means connected at one end to said bias pressure chambers and connectable at its other end to the source of fuel at the supply pressure; a fourth passage means connecting said bias pressure chambers for the controlled drainage of fuel therefrom to a source of fuel at substantially atmospheric pressure; and, first and second bias means operatively connected to said first and second servo valves respectively to normally bias each of said heads against its associated said valve seat, each with a predetermined force, whereby said second servo valve is operative as supplied with fluid as regulated by said first servo valve and with flow thereto controlled through said third flow control orifice passage means to regulate the pressure of fluid supplied to the governor chamber so as to control the axial position of the landed control valve as a function of engine speed and load.

4,329,959
DWELL CIRCUITRY FOR AN IGNITION CONTROL SYSTEM

Rupin J. Javeri, Elk Grove Village, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Jun. 15, 1979, Ser. No. 49,013
Int. Cl.³ F02P 5/04
U.S. Cl. 123—416 **11 Claims**



3. Dwell circuitry for an ignition control system of an internal combustion engine, said dwell circuitry comprising:

means for periodically developing a running count by counting pulses occurring at a predetermined, speed-independent rate between first and second predetermined time occurrences directly corresponding to periodic signal pulse transitions having occurrences related to predetermined angular positions of rotation of an engine crankshaft, and for providing at said second time occurrences maximum running counts related to the rotational speed of the engine crankshaft;

means for periodically receiving said maximum counts and effectively subtracting a predetermined number of counts therefrom to arrive at a resultant subtracted count said subtraction being completed at substantially said second time occurrences; and

means for periodically utilizing said resultant subtracted counts to initiate ignition dwell after said second time occurrence at which said maximum running count was created that resulted in said subtracted resultant count and at a predetermined time prior to the occurrence of the next of said periodic signal pulse transitions after said second time occurrences,

wherein said utilizing means comprises means for incrementing a count at a speed-independent rate after said second time occurrence at which said resultant count was created, and initiating dwell in response to said incremented count being at least equal to a threshold count, whereby dwell is substantially initiated at a predetermined time prior to the next occurrence of a maximum running count at said second time occurrences, and

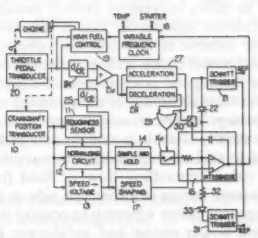
wherein said speed-independent predetermined pulse rate for incrementing said running count is fixed, and said subtraction means comprises a down counter which implements said effective subtraction by down counting pulses,

wherein said subtraction means includes means for loading said maximum running counts into said down counter substantially at said second time occurrences and for subsequently applying, as an input to said down counter for down counting thereby, a predetermined number of pulses, said resultant subtracted count being equal to said maximum running count less the number of down counted pulses.

4,329,960
FUEL CONTROL SYSTEM FOR AN INTERNAL COMBUSTION ENGINE

Richard G. Woodhouse, and Malcolm Williams, both of Birmingham, England, assignors to Lucas Industries Limited, Birmingham, England

Filed Feb. 27, 1980, Ser. No. 125,106
Claims priority, application United Kingdom, Mar. 14, 1979, 7908991
Int. Cl.³ F02D 5/00; F02B 3/00; F02P 5/04
U.S. Cl. 123—436 **6 Claims**



1. An internal combustion engine fuel control system comprising:

engine roughness sensing means for producing a roughness signal representing the change in speed of the engine between different engine shaft positions in relation to the engine speed;

a fuel control circuit, connected to said roughness sensing means for controlling the rate at which fuel is supplied to the engine;

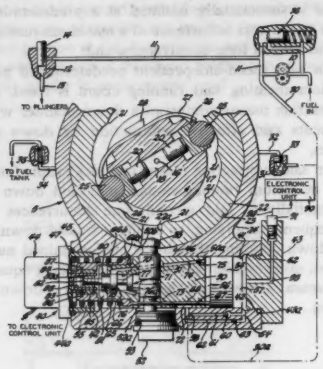
means for generating a speed demand signal which is supplied to said fuel control circuit; and

means, responsive to the rate of change of said demand signal and to the rate of change of the engine speed, for interrupting the effect of the roughness sensing means on the fuel control circuit during decelaration and/or acceleration.

4,329,961
DIESEL INJECTION PUMP TIMING CONTROL WITH ELECTRONIC ADJUSTMENT

Laird E. Johnston, Birmingham, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Sep. 29, 1980, Ser. No. 192,108
Int. Cl.³ F02M 59/20
U.S. Cl. 123—502 3 Claims



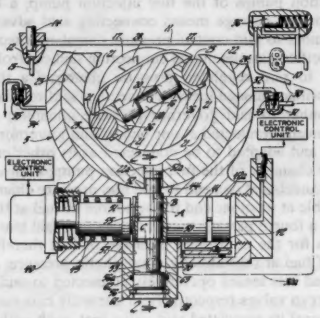
1. A timing control mechanism for an engine driven fuel injection pump of the type having an annular cam movably positioned in a pump housing, pump plungers movable relative to the cam to translate the contour of the cam into sequential pump strokes, and a source of fluid under a pressure correlated with an operating condition of the associated engine; said timing control mechanism including a cylinder in the pump housing; a power piston slidable in one end of said cylinder; a resilient means positioned in the opposite end of said cylinder and operatively connected to said power piston whereby to normally bias said power piston toward said one end of said cylinder; passage means including a flow control orifice connecting the source of fluid under pressure to said one end of said cylinder whereby to supply fluid to one side of said power piston so as to effect movement thereof toward the opposite end of said cylinder against the bias of said resilient means; a control piston slidable in said cylinder between said resilient means and said power piston and operatively connected to said cam to adjust the angular position thereof whereby to advance and retard the relative timing of the pumping strokes; a valve controlled passage means in said control piston, including a landed valve axially slidable in said control piston and having its stem fixed to said resilient means for movement therewith, said landed valve controlling flow of fluid from said valve controlled passage means to either one side or to the opposite side of said control piston whereby to control its axial position relative to said power piston; and, an electric actuator means operatively connected to said landed valve said electric actuator means being adapted to be connected to a controlled source of electrical power whereby to control the axial position of said landed valve relative to said resilient means as a function of engine operation.

4,329,962
DIESEL INJECTION PUMP TIMING CONTROL WITH ECCENTRIC CAM PIN

Laird E. Johnston, Birmingham, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Sep. 29, 1980, Ser. No. 192,109
Int. Cl.³ F02M 59/20
U.S. Cl. 123—502 3 Claims

1. In a timing control mechanism for an engine driven fuel injection pump of the type having an annular cam movably positioned in a pump housing, pump plungers movable relative to the cam to translate the contour of the cam into sequential pump strokes, and an advance piston coupled to the annular cam by a cam pin engaged in a cross-bore in the advance piston that is used to adjust the angular position of the cam whereby to advance and retard the relative timing of the pump strokes; the improvement wherein said cam pin includes an intermediate body in the form of a body of revolution about an axis journaled in a cross-bore in the advance piston, a circular upper head located eccentric of said axis of said intermediate

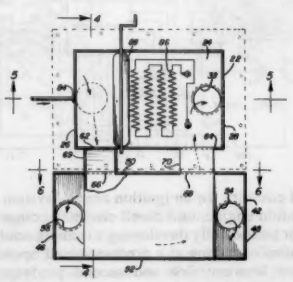


body and a circular lower abutment foot located eccentric of said axis of said intermediate body and offset 90° to said upper head; and, an externally accessible adjusting means operatively positioned in the pump housing in a location whereby to operatively abut against the lower abutment foot so as to adjustably effect angular movement of the cam pin and therefore of said upper head whereby to adjust the position of the cam for static timing of the pump relative to the engine.

4,329,963
AIR-FUEL CHARGE HEATER AND HUMIDIFIER

Charles C. Granger, 1203 Chestnut St., Henderson, N.C. 27536

Filed Dec. 17, 1979, Ser. No. 104,172
Int. Cl.³ F02M 31/00
U.S. Cl. 123—552 5 Claims



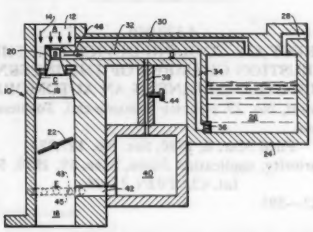
1. In combination with a combustion engine including an air and fuel charge forming device defining an air and fuel passage therethrough, an induction passage inlet end for receiving an air and fuel charge from said charge forming device and an engine exhaust system, a liquid vaporizing attachment, said attachment defining an intermediate passage extending therethrough including inlet and outlet ends communicated with the outlet end of said air and fuel passage and said induction passage inlet end, respectively, and an intermediate portion extending between said inlet and outlet ends of said intermediate passage, said intermediate portion including selectively operable electrical resistance heating means disposed therein for heating the fluid flow therethrough, and selectively operable

valve means for variably throttling the flow of fluid through said intermediate portion, means defining a bypass passage including inlet and outlet ends opening into said inlet and outlet ends of said intermediate passage and bypassing the intermediate portion of said intermediate passage, and exhaust gas heated heat exchange means operatively associated with said bypass passage intermediate the inlet and outlet ends thereof for heating the flow of fluid therethrough; whereby selective operation of said valve means enables heating of an air and fuel charge during initial engine operation by said heating means in said intermediate portion of said intermediate passage, subsequent heating of said charge by said heat exchange means in said bypass passage after initial engine warm-up and deactivation of said heating means, and subsequent prevention of overheating of said charge after engine warm up and during periods of higher ambient temperature by decreasing and increasing the portion of said charge flowing through said bypass passage and intermediate portion of said intermediate passage, respectively.

4,329,964
LIQUID FUEL CARBURETION SYSTEM

George Q. Morris, 655 Paseo Esmeralda, Newbury Park, Calif. 91320

Continuation-in-part of Ser. No. 888,045, Mar. 17, 1978, abandoned. This application Nov. 25, 1980, Ser. No. 210,187
Int. Cl.³ F02M *31/00*
U.S. Cl. 123—557 35 Claims



1. A carburetion system for an internal combustion engine comprising:

air inlet means of fixed configuration having upstream and downstream ends;

a fuel reservoir adapted to contain an essentially constant level of fuel therein;

first passageway means of predetermined fluid flowing capacity, for flowing air out of said air inlet means and fuel into said air inlet means, extending between said air inlet means proximate the upstream end thereof and said fuel reservoir below the level of fuel therein;

throttle valve means disposed in said air inlet means downstream from said first conduit means;

second passageway means of predetermined fluid flowing capacity for flowing air and fuel from said first passageway means to said air inlet means at a location downstream from said throttle valve means;

said second passageway means connected to said first passageway means at a location such that air flows from said air inlet means through said first passageway means into said second passageway means when the engine is at idle load conditions;

air flow from said first passageway means into said second passageway means causing a pressure reduction of predetermined magnitude in said first passageway means;

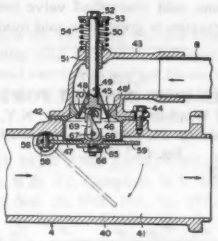
said predetermined fluid flowing capacity of said first passageway means being specifically proportioned to said predetermined fluid flowing capacity of said second passageway means so as to determine said magnitude of said pressure reduction; and

said magnitude being determined such that an essentially correct amount of fuel is metered to the engine for engine operation at all speeds and loads.

4,329,965
DIESEL ENGINE EXHAUST GAS RECIRCULATION AND INTAKE AIR FLOW CONTROL SYSTEM

Tatehito Ueda, Susono, and Kunihiko Hiyama, Chiryu, both of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Apr. 7, 1980, Ser. No. 137,650
Claims priority, application Japan, Oct. 9, 1979, 54-130496
Int. Cl.³ F02M *25/06*
U.S. Cl. 123—569 4 Claims



1. In a diesel engine, comprising an air intake passage, an exhaust system, and an exhaust gas recirculation passage leading from the exhaust system to a point in the air intake passage;

a system for control of flow of recirculated exhaust gases and flow of intake air, comprising:

an intake air flow control valve, mounted in the air intake passage, comprising a plate valve element rotatable around an axis arranged to traverse the air intake passage and which controls the flow resistance to air of the part of the air intake passage upstream of said point;

a recirculated exhaust gas flow control valve, mounted in the exhaust gas recirculation passage, which comprises a circular valve seat which defines a valve and a conical poppet valve element which engages into said circular valve seat so as to variably throttle said valve port and controls the flow resistance to exhaust gases of the exhaust gas recirculation passage;

and a link mechanism which operatively connects said recirculated exhaust gas flow control valve only with said intake air flow control valve so that, as the flow resistance of the one increases, that of the other decreases, and vice versa;

the recirculated exhaust gas flow control valve substantially completely interrupting flow of recirculated exhaust gases, when the intake air flow control valve is at its operating condition wherein it provides a minimum resistance to flow of air.

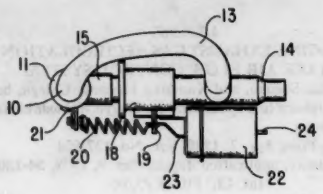
4,329,966
CONTROLLED POLLUTION CONTROL VALVE BY-PASS DEVICE FOR CARBURETED INTERNAL COMBUSTION ENGINE

Dean E. Ramsley, Box 73, Viborg, S. Dak. 57070

Filed Jun. 9, 1980, Ser. No. 157,986
Int. Cl.³ F02M *25/06*
U.S. Cl. 123—572 4 Claims

1. A device comprising in combination with an internal combustion engine having a crankcase and an intake system including a carburetor; a line from the crankcase of said engine to the intake system below the carburetor, a pollution control valve in said line and a by-pass means in said line adapted to

by-pass said pollution control valve, and vacuum controlled valve means in said by-pass means adapted normally to close



said by-pass means, said controlled valve being operable to open when the vacuum is greatest in said intake system.

4,329,967

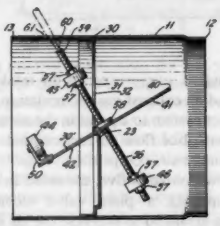
ADJUSTABLE FLUE CONTROL FOR FURNACES

Nat Levenberg, 2 Windsor Pl., Lynbrook, N.Y. 11563

Filed Sep. 26, 1980, Ser. No. 191,009

Int. Cl.³ F23L *3/00*

U.S. Cl. 126—293 **2 Claims**



1. In a furnace flue damper construction including a length of flue pipe directly connected in series with the smoke pipe emanating from a furnace, an orificed plate positioned transversely with respect to the principal axis of said pipe therein, and a butterfly type valve member having a shaft pivotally mounted with respect to said orificed plate to selectively close an orifice therein, the improvement comprising: first, second and third weight elements; said first weight element being mounted upon a first side of said valve member; a threaded shaft extending through said valve member and threadedly engaged therewith, said second and third weight elements being threadedly engaged upon said shaft adjacent oppositely disposed ends thereof, one of said ends having tool engaging means thereon; said flue pipe having a transversely extending opening therein of diameter corresponding to that of said shaft, serving to expose said free end thereof when said valve member is in predetermined position, and means for manually placing said valve member in said predetermined position.

4,329,968

OIL SEPARATING SYSTEM FOR BLOWBY GAS

Yoshikazu Ishikawa, Chofu, and Masayuki Honma, Tokyo, both of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Apr. 14, 1980, Ser. No. 140,327

Claims priority, application Japan, Apr. 16, 1979, 54/49306[U]

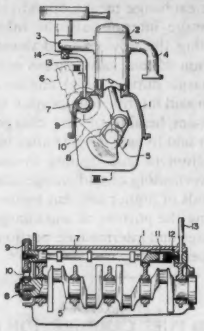
Int. Cl.³ F02M *25/06*

U.S. Cl. 123—573 **12 Claims**

1. An oil separating system for blowby gas to be recirculated to an intake system of an internal combustion engine having a crankcase, comprising in combination:

a jackshaft disposed in the crankcase to operate engine accessories, said jackshaft being driveably connected at its one end with a crankshaft; and

an oil separator through which passes the blowby gas recirculated to the intake system, a part of said oil separator



being securely connected to another end of said jackshaft to be rotatable so as to separate engine oil mist from blowby gas to be recirculated to the intake system, by the action of centrifugal force developed by the rotation thereof with the rotation of said jackshaft.

4,329,969

DIRECT AIR COOLING DEVICE FOR THE COMBUSTION CHAMBER OF THE INTERNAL COMBUSTION ENGINE IN AN AUTOMOBILE

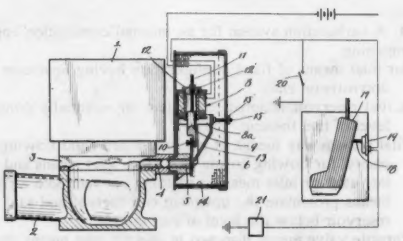
Mitsuji Kawai, No. 27 1-chome Kaname-cho, Toshima-ku, Tokyo, Japan

Filed Mar. 6, 1980, Ser. No. 127,773

Claims priority, application Japan, Mar. 19, 1979, 54-31202

Int. Cl.³ F02N *23/04*

U.S. Cl. 123—585 **3 Claims**



1. A direct air cooling device for a combustion chamber of an internal combustion engine in an automobile, comprising:

an air supply tube(2) having a first end thereof connected to a cylinder of said internal combustion engine;

passage means(3) connected between a carburetor of said internal combustion engine and a second end of said air supply tube(2);

said passage means(3) being provided with an air suction opening(4);

an air suction port member(5) connected to said passage means(3) and communicating with said air suction opening(4);

a solid, imperforate, flat valve plate(6) disposed adjacent to an open end of said air suction port member(5);

an electromagnet(8);

an iron core movable within and under the influence of said electromagnet(8);

said solid, imperforate, flat valve plate(6) being suspended from said iron core(9);

said solid, imperforate, flat valve plate(6) normally facing and bearing against said air suction port member(5) and closing said open end of said air suction port member(5);

said solid, imperforate, flat valve plate(6) being movable to uncover said open end of said air suction port member(5) under the influence of said electromagnet(8);

an air cleaner mounting plate(7) affixed to said air suction port member(5); and

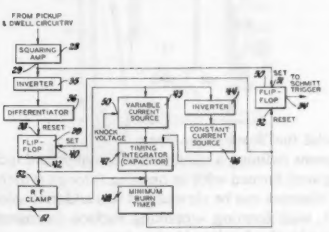
an air cleaner(14) connected to said air cleaner mounting plate(7) and surrounding said solid, imperforate, flat valve plate(6), said open end of said air suction port member(5), said electromagnet(8), said iron core(9) and a major portion of said air suction port member(5).

4,329,970

ENGINE SPARK TIMING CONTROL WITH ADDED RETARD AND RF SIGNAL PROTECTION

Kenneth D. Mowery, Kokomo, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed May 5, 1980, Ser. No. 146,390
Int. Cl.³ F02P 5/04, 9/00
U.S. Cl. 123—618 2 Claims



1. In combination:

a spark ignited internal combustion engine including means effective to generate spark timing signals and means effective to generate spark events in response to trigger signals;

means effective to generate a triangular wave voltage which initiates movement in one direction toward a reference voltage in response to each spark timing signal and initiates movement in the opposite direction in response to each trigger signal;

comparator means having an input normally responsive to the triangular wave voltage, the comparator means being effective to generate a trigger signal when the voltage applied to the input equals the reference voltage;

clamp means effective, when activated by each trigger signal, to clamp the input of the comparator means to a voltage effective to prevent generation of the trigger signal, the clamp means being deactivated by each spark timing signal, whereby a spark event is prevented from occurrence due to received RF signals during the period from each spark event until the next spark timing signal.

4,329,971

ELECTROMAGNETIC PROPULSION POWER SYSTEM

George A. Kemeny, Wilkin Township, Allegheny County, and Joseph G. Gorman, Murrysville, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jan. 14, 1980, Ser. No. 111,628
Int. Cl.³ F41F 1/02
U.S. Cl. 124—3 15 Claims

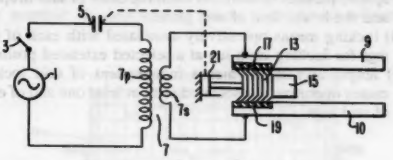
13. A circuit for supplying DC power to a pair of parallel conductors utilized in an electromagnetic projectile launcher, said circuit comprising

means for providing high DC current;

an induction coil for temporarily storing electromagnetic energy;

means for closing the circuit;

said current providing means, said circuit closing means and said induction coil being connected in a series loop; and



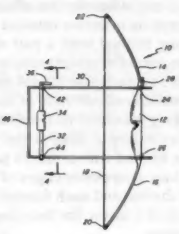
a diverter switch for switching current from the series circuit containing said induction coil said circuit closing means and said current providing means to a circuit containing said induction coil, and said parallel conductors.

4,329,972

ARCHERY BOW AND ARROW STABILIZER

Philip H. Wilson, R.D. #2, Campbell, N.Y. 14821

Filed Sep. 29, 1980, Ser. No. 191,363
Int. Cl.³ F41B 5/00
U.S. Cl. 124—24 R 5 Claims



1. An archery bow having a flexible frame and a cable attached to said flexible frame for propelling an arrow, comprising:

a rigid unitary stabilizing member mounted on said flexible frame and positioned to bear against an area of an archer's body trunk portion at a point selected by an archer, said stabilizing member being attached to said flexible frame at first and second positions on said flexible frame and wherein said stabilizing member is of a substantial U-shape, said stabilizing member further having mounted thereon a bar which comprises a centrally mounted hand grip and arrow stop; and

means for fixing said bar in a position on said stabilizing member to position said arrow stop at a predetermined point for an arrow length selected by said archer.

4,329,973

ADAPTER FOR VENTING A STOVE THROUGH A FIREPLACE

Richard J. Scullin, Jr., Williamstown, Mass., assignor to Mohawk Industries, Inc., Adams, Mass.

Filed Dec. 26, 1979, Ser. No. 106,480
Int. Cl.³ F24B 7/00
U.S. Cl. 126—123 2 Claims

1. An adapter for connecting the vent of a stove to the flue of a fireplace, comprising

(a) a generally rectangular panel of a relatively rigid self-supporting thermal insulating material adapted to be formed with a circular opening to receive a section of stove pipe therethrough,

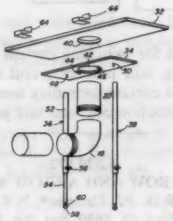
(b) a relatively stiff unitary flat metal plate of similar shape to

said panel and of smaller dimensions adapted to be mounted against the lower face of said panel and formed with a circular opening therethrough of a size generally corresponding with the opening in said panel and adapted to register therewith.

(c) a pair of telescopic tubular legs adapted to be braced in spaced parallel relation between the floor of said fireplace and the lower face of said plate,

(d) locking means operatively associated with each of said legs for locking each leg at a selected extended position,

(e) length adjustment means independent of said locking means operatively associated with at least one end of each of said legs,



(f) said adjustment means including a screw threaded coaxially to said one end whereby the effective length of said leg may be altered by selective rotation of said screw, and,

(g) said plate being formed with a pair of downwardly extending studs mounted in spaced relation to the lower face of said plate, one on each side of said opening and adapted to engage the tubular upper ends of said legs,

(h) said screw being mounted to the lower end of said leg and including an enlarged head at the outer end thereof,

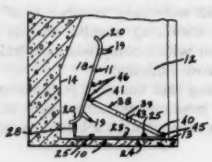
(i)said plate being formed with at least a pair of downwardly extending flat tabs at opposite edges of said plate opening and tangential thereto and each formed with a hole therethrough to receive a screw for fastening said plate to said stove pipe sections.

4,329,974

FIREPLACE GRATE LIFT AND LOCK ATTACHMENT

Robert B. Reichert, E. 7918 Glass, Spokane, Wash. 99206

Filed Aug. 4, 1980, Ser. No. 174,915
Int. Cl.³ F23H *13/00*
U.S. Cl. 126—164 **5 Claims**



1. An attachment mountable to a fireplace grate having a grillwork and integral fixed downwardly depending legs for mounting the grate to a fireplace hearth for pivotal movement between a horizontal operative position and an upright inoperative position wherein the grillwork and legs are clear of the hearth, comprising:

an elongated hearth mounting member adapted to fit flush against the hearth;

an upstanding member on the elongated hearth mounting member adapted to project upwardly from the hearth;

a first hinge member on said upstanding member;

a second hinge member adapted to be mounted to the grillwork of the fireplace grate;

hinge pin means for pivotably connecting the first and second hinge members and defining a grate pivot axis;

a brace member; and

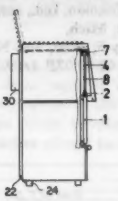
brace pivot means mounting the brace member to the hearth mounting member for pivotal movement thereon between a horizontal normal position resting against the hearth mounting member and an upwardly inclined operative position for bracing the grate in its upright inoperative position.

4,329,975

SOLID FUEL STOVE UTILIZABLE AS A FIREPLACE

Gerhard Debus, Steffenberg; Erwin Hof, and Günter Herrmann, both of Herborn, all of Fed. Rep. of Germany, assignors to Buderus Aktiengesellschaft, Wetzlar, Fed. Rep. of Germany

Filed Aug. 15, 1980, Ser. No. 178,308
Claims priority, application Fed. Rep. of Germany, Aug. 17, 1979, 7923525[U]
Int. Cl.³ F23M *7/00*
U.S. Cl. 126—192 **3 Claims**



1. A solid fuel stove comprising:

wall means defining a combustion chamber and including a front wall formed with an opening through which a fire in said chamber can be viewed and fuel added to said fire and a top wall forming a cooking surface for items can be heated by the fire in said chamber;

a hood projecting forwardly from said front wall and disposed above said opening;

a pair of lateral guides within said hood at opposite sides of said opening, each of said guides being formed with a longitudinally extending slot communicating with a rest at the top of each guide; and

a door dimensioned to cover said opening and disposed forwardly of said front wall, said door having at its top a pair of laterally extending pins projecting from opposite edges of said door into respective one of said slots whereby said slots guide said door upwardly into said hood for concealment by said hood, said pins engaging said rests in an upper concealed position of said door for releasably retaining said door substantially completely within said hood, thereby maintaining said cooking surface free to receive said articles.

4,329,976

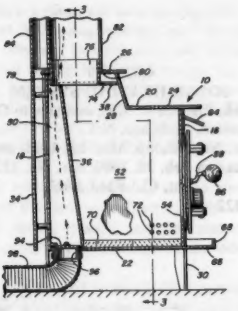
STOVE WITH DRAFT AIR COOLING OF REAR, OPPOSITE SIDE AND FLUE PIPE

J. D. Jackson, 38751 Camp Creek Rd., Springfield, Oreg. 97477

Filed Apr. 8, 1980, Ser. No. 138,369
Int. Cl.³ F23J *11/00*; F24B *3/00*; F24C *1/14*
U.S. Cl. 126—312 **7 Claims**

1. A room heater including a pair of opposite side walls and front, rear and top walls interconnecting and extending between front, rear and top and bottom marginal portions of said side walls, a pair of inner side panels spaced inwardly of said side walls and extending between said top and bottom walls, a rear inner panel spaced inward of said rear wall and extending between said side walls and having the rear marginal portions of said inner side panels secured thereto inwardly of said side walls, said side panels including air passage openings formed therethrough in the forward lower portions thereof, said

heater defining a firebox therein between said side panels and between said rear panel and said front wall and including a flue outlet opening outwardly from an upper rear portion of said firebox, and combustion air inlet means operative to admit combustion air into the lower portion of the area between said rear wall and said rear panel, the front and rear portions of the areas between said side walls and the corresponding side panels being closed by said front and rear walls, respectively, said top wall including lower forward and upper rear portions interconnected by an upstanding intermediate portion extending between the front and rear marginal portions of said upper rear and lower forward portions, a generally horizontal inner top wall portion spaced below said upper rear portion rearward of said intermediate portion extending between said side walls and having front and rear marginal portions secured to said intermediate portion and the upper marginal portion of said rear panel, the upper rear marginal edge of said inner side panels, and said inner top wall portion having openings formed therein opening downwardly into the upper rear portions of



said areas between said side walls and corresponding side panels, the upper marginal portion of said area between said rear wall and said rear panel opening into the area defined between said top wall upper rear portion and said inner top wall portion, said flue outlet opening including an upstanding tubular outlet fitting secured downwardly through the upper rear portion of said top wall and also downwardly through said inner top wall with a rear portion of the interior of said tubular outlet fitting disposed to the rear of the upper marginal portion of said rear inner panel and opening downwardly directly into the upper portion of the area between said rear wall and rear inner panel, the rear portion of the interior of said outlet fitting opening downwardly into said area between said rear wall and said rear inner panel serving as a venturi to admit a portion of the air supplied to the area between said rear wall and said rear wall panel by said combustion air inlet means directly into said outlet fitting for admixing with and thus cooling of the gaseous byproducts of combustion discharged into said outlet fitting from said firebox.

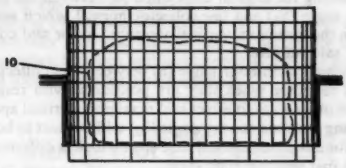
4,329,977

ROTATABLE COOKER

Ralph H. Orter, P.O. Box 2074, Prescott, Ariz. 86301

Filed Jan. 18, 1979, Ser. No. 4,731
Int. Cl.³ B65D *8/00, 6/12*
U.S. Cl. 126—369 **1 Claim**

1. An adjustable and rotatable stovetop cooker of open mesh material comprizing a first, or upper half and a second, or lower half, said first half having a cross-sectional area slightly greater than that of the second half to allow the halves to be telescopingly engaged, each of said halves having an open end and a closed end, each of said ends including a base member extending around the periphery thereof and extending outwardly thereform so as to space each of said ends from a supporting surface when its corresponding base member is placed thereon, said first half including two first handle members located on opposing portions thereof and extending outwardly from said half, said first handle members being located about halfway between the closed and open ends of said first half, said second half including two second, elongated handle members, each of which includes a grasping portion, and an elongated portion, the elongated portions having first and second ends and being attached at their first ends to the second base member at opposing portions thereof and extending



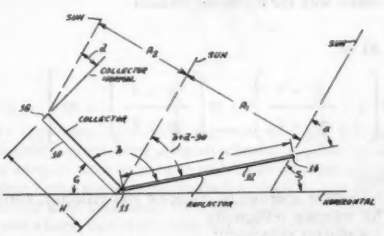
toward the open end of the second half, said elongated portions being located on the outside of, and spaced from, the exterior of the second half so as to allow the first half to slide therebetween, the second ends of the elongated portions being attached to the grasping portions, the grasping portions being so spaced from the open end of the second half as to be in spaced, opposing relationship to the first handle members when the first and second halves are telescopingly engaged.

4,329,978

SOLAR ENERGY DEVICES

Eric M. Wormser, 88 Foxwood Rd., and Carl R. Mezoff, 81A Rippowam Rd., both of Stamford, Conn. 06902

Filed Apr. 13, 1979, Ser. No. 29,732
Int. Cl.³ F24J *3/02*
U.S. Cl. 126—417 **10 Claims**



1. A method of optimizing energy collection by radiant energy collection apparatus which includes a collector device and an associated reflector device which is pivotally moveable with respect to the region of the lower edge of said collector device, comprising the steps of

positionally fixing said collector at a desired angle with respect to a chosen angle of incidence of the radiant energy to be collected, such that the effectiveness of said collector is optimized over a selected time span said time span being not greater than a solar year,

positioning said reflector at a first angle with respect to said collector to maximize the vertical aperture effectuated by them, so as to cause said reflector to reflect a desired amount of the energy impinging thereon onto said collector over the said selected time span, and subsequently angularly re-positioning said reflector to a second angle with respect to said collector by pivotally moving it with respect to said collector so as to cause said reflector to reflect a desired amount of the energy reflected therefrom onto said collector over a second selected time span which

is not greater than a solar year and which is different from said first time span.

2. A method of optimizing energy collection by solar collection apparatus which includes a collector device and an associated reflector device which is pivotally moveable with respect to the lower edge of said collector device comprising the steps of

selecting a first sun ray angle (S_1) with respect to horizontal for a first selected seasonal time span which is less than a full solar year,

establishing the angular disposition (d) between the first sun ray angle (S_1) and the collector normal which will provide the maximum vertical aperture (A) for said collector and said reflector,

establishing an interior angle (b) between said collector and said reflector when they are positioned with respect to each other so as to effect said maximum vertical aperture,

selecting a second sun ray angle (S_2) with respect to horizontal for a second seasonal time span which is different from said first seasonal time span,

and establishing an angle (a) between said second sun ray angle and said reflector at which the maximum amount of radiant energy will be reflected by said reflector to said collector for the period of said second seasonal time span without alteration of the angular disposition of said collector with respect to horizontal.

10. Apparatus for the collection of solar energy comprising

collector means for collecting solar energy while being fixedly positioned with respect to a design sun ray selected for a selected portion of the solar year which is less than the full solar year in length,

a reflector, one edge of which is juxtaposed to one edge of said collector, said reflector being pivotally moveable with respect to said collector about said juxtaposed edge,

and means to fix said reflector at more than one selected position among the positions into which said reflector is pivotally moveable with respect to said collector,

the angle (d) at which said collector is fixed with respect to said design sun ray being at that value which produces the greatest vertical aperture (A) being substantially in accordance with the following formula

$$A = RL \sin \left[d \left(1 - \frac{\frac{L}{H} + 1}{\frac{L}{H} + 2} \right) + 90 \left(\frac{\frac{L}{H} + 3}{\frac{L}{H} + 2} \right) - 90 \right] + H \operatorname{Cos} d$$

wherein

A=Vertical aperture of collector and reflector, corrected for reflector reflectivity

R=Reflector reflectivity

L=Length of Reflector

d=Angle of incidence of selected sun ray to collector surface, measured from the collector normal

H=Vertical height of collector

the first among said selected positions at which said reflector is fixed with respect to said collector at an angle (b) substantially in accordance with the following formula

$$b = 90 \left[\frac{\frac{L}{H} + 3}{\frac{L}{H} + 2} \right] - d \left[\frac{\frac{L}{H} + 1}{\frac{L}{H} + 2} \right]$$

wherein

L=Length of Reflector

H=Vertical height of collector

b=Interior angle between collector and reflector

d=Angle of incidence of selected sun ray to collector surface, measured from the collector normal

and other among said selected positions each being at an angle (a) which is substantially in accordance with the following formula

$$H \sin [G + S_n - 2a] = L \sin a$$

wherein

H=Vertical height of collector

G=Collector angle with the horizontal

S_n=the selected sun ray angle for a different seasonal time span

a=Angle between sun ray, S, and reflector surface

L=Length of Reflector.

4,329,979

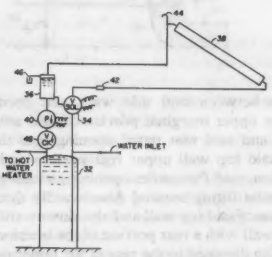
SOLAR HEATING SYSTEM

Arthur M. Frank, Plainview, N.Y., assignor to Grumman Aerospace Corporation, Bethpage, N.Y.

Division of Ser. No. 885,356, Mar. 13, 1978, abandoned. This application Feb. 20, 1980, Ser. No. 122,856

Int. Cl.³ F24J 3/02

U.S. Cl. 126—422 **2 Claims**



1. A domestic solar hot water system having a water input from a water source and an output comprising:

an array of interconnected solar assembly units having an input and output port;

a pressurized preheater tank connected between the water input and output operable to receive pressurized preheated water from said solar array;

a differential temperature valve connected between the water input and said solar array input port, being adjustable to allow the flow of water from the water input into said solar array when said array is receiving sufficient solar energy to heat the water therein to a temperature greater than that of the water in said preheater tank;

means to restrict the flow of water between said differential temperature valve and said solar array to a predetermined rate;

an insulated holding tank connected to receive the flow of water from said solar array output;

pumping means connected to the output of said holding tank for communicating the water flow from said low pressure insulated holding tank to said pressurized preheater tank; and

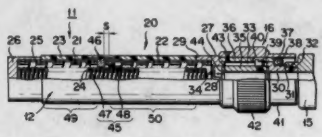
a check valve connected between said pumping means and the water output to permit water flow only in a direction away from said pump.

4,329,980

FLEXIBLE SHEATH FOR AN ENDOSCOPE

Masaaki Terada, Hachioji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Feb. 25, 1980, Ser. No. 124,475
Claims priority, application Japan, Mar. 6, 1979, 54/25905
Int. Cl.[3] A61B *1/00*
U.S. Cl. 128—4 11 Claims



1. A flexible sheath arrangement for an endoscope comprising:

a flexible hollow cylindrical tube having two ends; and

a single helical coil spring inserted into the flexible hollow cylindrical tube and forming with said hollow cylindrical tube the outer sheath of the endoscope, the single helical coil spring having two ends and an intermediate part between said two ends, one end of the helical coil spring being engageable with one end of the hollow cylindrical tube for adjusting the flexibility of the hollow cylindrical tube;

a helical coil spring-compressing means provided at the other end of the hollow cylindrical tube for urging the helical coil spring toward said one end of the hollow cylindrical tube by pressing against the other end of the helical coil spring;

engaging means provided in said hollow cylindrical tube for holding said intermediate part of the helical coil spring and comprising at least one abutment formed on said hollow cylindrical member and extending inward therefrom; and a stop fixedly mounted on a portion of said helical coil spring which is adjacent to said abutment and remote from said one end of the hollow cylindrical tube with respect to said abutment, for engaging said abutment when said helical coil spring is compressed;

a first clearance formed between said other end of the helical coil spring and the helical coil spring-compressing means; and

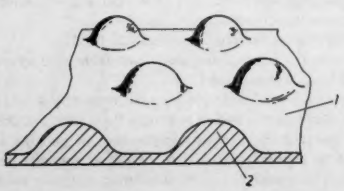
a second clearance narrower than said first clearance and provided between the abutment and the stop.

4,329,981

FOOT MASSAGE MAT

Willi Dungl, Vienna, Austria, assignor to Semperit AG, Vienna, Austria

Filed Jan. 28, 1980, Ser. No. 115,620
Int. Cl.[3] A61H *1/02*
U.S. Cl. 128—25 B 19 Claims



1. A foot massage mat formed of rubber, plastics material or the like, comprising:

a mat structure provided with hill-like proturbances;

said protuberances being spaced from one another to form valleys therebetween;

each of said protuberances has an approximately circular configuration in plan view, the diameter of said circular configuration being between five and ten centimeters;

a plurality of said protuberances are distributively arranged in spaced relationship from one another;

the spacing of said protuberances from one another, measured from apex to apex between neighboring protuberances, amounts to between about eight and fifteen centimeters; and

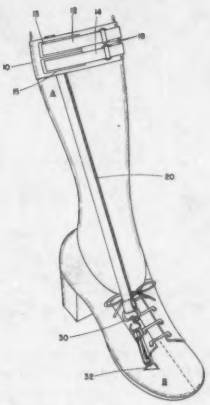
the spacing of said protuberances is coordinated to the foot of the user such that the heel and toe ball of the foot rest in a valley between said protuberances and the foot arch and toes rest upon raised portions.

4,329,982

ORTHOTIC FOOT ASSIST APPARATUS

Audrey C. Heaney, 200 Lexington Ave., Oyster Bay, N.Y. 11771

Filed Oct. 17, 1980, Ser. No. 198,063
Int. Cl.[3] A61F *3/00*
U.S. Cl. 128—80 E 4 Claims



1. An apparatus for assisting a person having a foot-drop type disability, comprising; a leg attachment member; an elastomeric support strap secured to said leg attachment member; and a shoe with a cooperating means for attaching said support strap to said shoe, said means for attaching further comprising a loop and a latch, one of said loop and said latch being secured to said shoe of the wearer at a point generally on the forward portion of said shoe and on the lateral side of said shoe, while the other of said loop and said latch is secured to said elastomeric support strap which, in turn, is secured to said leg attachment means at a point on the lateral side of the wearer's leg so that when said apparatus is worn said strap contracts to raise the wearer's foot during the time said wearer is not forcibly extending said strap by the downward extension of said foot and simultaneously effects eversion when said strap operates to raise said foot.

4,329,983

GUIDE DEVICE FOR ENDOTRACHEAL TUBES

Thomas S. Fletcher, 11002 W. 56th Ter., Shawnee Mission, Kans. 66203

Filed May 9, 1980, Ser. No. 148,409
Int. Cl.[3] A61M *25/00*
U.S. Cl. 128—207.14 3 Claims

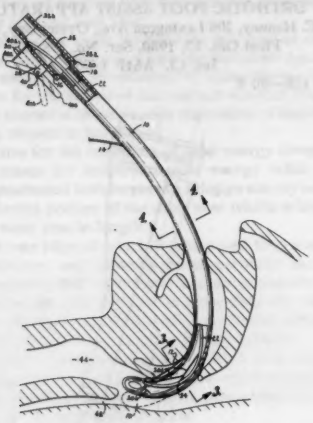
1. In a device for intubating the trachea, the combination of: an elongate endotracheal tube of flexible construction adapted to intubate the trachea, said tube having one end

portion insertable into the trachea and an opposite end portion which remains outside of the body during intubation;

an elongate flexible bar member disposed within said tube and having a length to extend substantially between said end portions of the tube, said bar member having a first end located adjacent said one end portion of the tube and a second end located adjacent said opposite end portion of the tube;

a fitting removably attached to said second end portion of the tube and adapted for connection with an air source to direct air into the endotracheal tube, said fitting having a side portion;

an elongate flexible line extending generally along the length of said bar member and having one end connected with said first end of the bar member and an opposite end extending slidably through said side portion of the fitting and adapted to be pulled from the exterior of the endotracheal tube with the second end of said bar member contacting the fitting to retain the bar member in said tube when said line is pulled, said line having a slidable connection with said bar member at a preselected location thereon spaced from said first end of the bar member to provide a free length of the line between said first end of the bar member and said preselected location; and



means for establishing a sliding connection of said line with said bar member at a location between said first end of the bar and said preselected location,

whereby pulling of said opposite end of the line shortens said free length of the line to effect bowing of said bar member between said first end and said preselected location to engage the bar member against said tube in a manner to curve said one end portion of the tube toward the trachea, said sliding connection holding the line adjacent said bar member to effect smooth bowing of the bar member between said first end portion and said preselected location.

4,329,984

ENDOTRACHEAL-TUBE STABILIZER

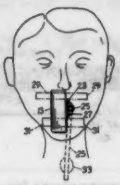
David Kervin, 61 Conchlight Ct., Springfield, Ill. 62703

Filed Jan. 13, 1981, Ser. No. 224,758

Int. Cl.³ A61M *25/02*

U.S. Cl. 128—207.14 **4 Claims**

1. An endotracheal-tube stabilizer, comprising: a first flange defining a front surface, a rear surface and opposing side edges, a bite block having a first end secured to the rear surface of said first flange and extending centrally in a substantially normal direction therefrom, said bite block having an upper and a lower surface adapted to be held in the mouth of a patient between the upper and lower teeth and being of a sufficient thickness to maintain the upper and lower teeth in spaced apart relation, said first flange having an upper portion extending laterally from said bit block in a substantially perpendicular direction to said upper bite surface and a lower portion extending laterally from said bit block in a substantially perpendicular direction to said lower bite surface, said upper and lower portions of said first flange being adapted to overlie the upper and lower lips of the patient, respectively, and be secured thereto as by strips of adhesive tape, a second flange secured to a side edge of said first flange and extending centrally therefrom in a direction substantially perpendicular to and outwardly from said front surface of said first flange, said second flange being adapted for attachment of an endotracheal tube thereto in a direction substantially perpendicular to said first flange as by wrapping adhesive tape therearound.



4,329,985

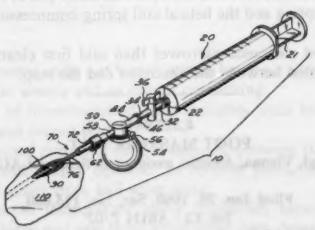
VEIN DISTENTION SYSTEM

Lawrence I. Bonchek, Milwaukee, Wis., assignor to Shiley, Inc., Irvine, Calif.

Filed Jan. 18, 1980, Ser. No. 113,247

Int. Cl.³ A61M *5/00*

U.S. Cl. 128—214 R **18 Claims**



1. Apparatus for distention of a vein segment under controlled pressure, comprising:

a syringe for containing an irrigation fluid;

a cannula for introducing said fluid from said syringe into said vein segment; and

means exterior of said vein segment connecting said syringe and said cannula and providing a fluid path therebetween, for limiting the hydrostatic pressure of said fluid in said vein to a predetermined maximum as said fluid is introduced into said vein, said maximum pressure being independent of either the pressure applied to said syringe or the rate of flow of said fluid from said syringe into said cannula, said maximum pressure being determined substantially solely by the physical characteristics of said pressure limiting means.

4,329,986

TREATMENT OF AN EXTRACORPOREAL STREAM OF BLOOD WITH A DIALYZABLE CHEMOTHERAPEUTIC AND A FLUORESCABLE TRACER

Albert L. Babb, Seattle, Wash., assignor to Biomedics, Inc., Arlington Heights, Ill.

Filed Jun. 14, 1979, Ser. No. 48,334

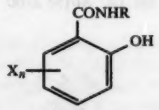
Int. Cl.[3] A61K *33/00*; A61M *5/00*; G01N *31/00, 33/48, 33/52, 33/84, 35/00*; A61K *49/00*

U.S. Cl. 128—214 R 13 Claims

1. A method for treating whole blood with a dialyzable chemotherapeutic agent in an extracorporeal stream of said blood which comprises:

removing whole blood from a patient and forming the whole blood into an extracorporeal stream;

introducing into the extracorporeal stream said chemotherapeutic agent together with a fluorescable tracer means that is dialyzable therefrom at a rate that is a function of the dialysis rate for the chemotherapeutic agent, said fluorescable tracer means being a member of the group consisting of an N-substituted benzamide represented by the formula



wherein R is a member of the group consisting of hydrogen and methyl, X is a member of the group consisting of halogen and alkoxy having no more than two carbon atoms, and n is an integer having a value of 0 or 1, and physiologically tolerable alkali metal salts thereof;

dialyzing the extracorporeal stream so as to remove therefrom in a dialysate the chemotherapeutic agent and the tracer means at respective rates that are a function of one another;

irradiating a portion of the obtained dialyzate with fluorescence-exciting electromagnetic radiation;

passing the irradiated portion over a detector means responsive to fluorescence emitted by the tracer means present in said portion and generating an electrical signal having a magnitude indicative of the intensity of emitted fluorescence;

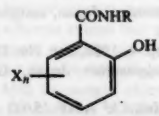
energizing an indicator means with the generated signal; and returning the blood to the patient.

2. The method in accordance with claim 1 wherein the chemotherapeutic agent is a cyanate and wherein the tracer means is salicylamide.

8. A method for treating whole blood with a dialyzable chemotherapeutic agent in an extracorporeal stream of said blood which comprises:

removing whole blood from a patient and forming the whole blood into an extracorporeal stream;

introducing into the extracorporeal stream said chemotherapeutic agent together with a fluorescable tracer means that is dialyzable therefrom at a rate that is a function of the dialysis rate for the chemotherapeutic agent, said fluorescable tracer means being a member of the group consisting of an N-substituted benzamide represented by the formula



wherein R is a member of the group consisting of hydrogen and methyl, X is a member of the group consisting of halogen and alkoxy having no more than two carbon atoms, and n is an integer having a value of 0 or 1, and physiologically tolerable alkali metal salts thereof;

dialyzing the extracorporeal stream so as to remove therefrom the chemotherapeutic agent and the tracer means at respective rates that are a function of one another;

contacting for a predetermined time period at least a portion of the dialyzed extracorporeal stream across a dialysis membrane with an aqueous secondary dialysis solution devoid of said tracer means;

thereafter recovering said aqueous secondary dialysis solution;

irradiating an aliquot of the recovered aqueous secondary dialysis solution with fluorescence exciting electromagnetic radiation;

passing the irradiated aliquot over a detector means responsive to fluorescence emitted by the tracer means present in said aliquot and generating an electrical signal having a magnitude indicative of the intensity of emitted fluorescence;

energizing an indicator means with the generated signal; and returning the blood to the patient.

4,329,987

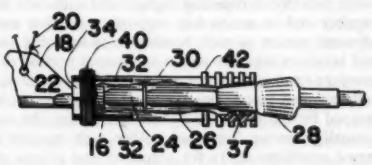
SUBCLAVIAN INTRAVENOUS CLAMP

Thomas D. Rogers, 4211 Davis La., Chattanooga, Tenn. 37416; Rhonda J. Edmons, 7106-B Holland La., Chattanooga, Tenn. 37421, and Gordon D. McBryar, Chattanooga, Tenn., assignors to Thomas Derrill Rogers and Rhonda Joy Edmons, both of Chattanooga, Tenn.

Filed Nov. 21, 1980, Ser. No. 178,500

Int. Cl.[3] A61M *5/00*

U.S. Cl. 128—214 R 6 Claims

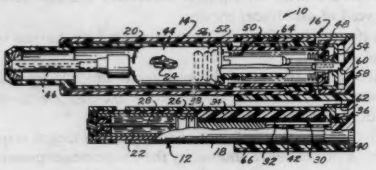


1. A clamp for securing the connection of one end of a subclavian catheter assembly to a cooperating end of intravenous tubing, said intravenous tubing having an elongated plug-like insert at the connection end and a bulbous portion adjacent thereto, and the catheter assembly having a substantially cylindrical needle head with an intravenous socket at the connection end for frictionally receiving said plug-like insert, the other end of the needle head having a substantially planar surface radially spaced from a central portion, said clamp comprising a substantially elongated tubular member of finite length positioned about the connecting ends of the catheter assembly and tubing, said clamp having an internal wall, rib means formed on said wall adjacent the intravenous end thereof at least partly about the circumference a distance sufficient for gripping the surface of said bulbous portion, a plurality of circumferential spaced flap means formed on said tubular member at the other end thereof and defined between elongated slots spaced about the circumference, each of said flap means being radially bendable relative to the surface of said tubular member, jaw means formed on the free end of each flap means extending radially toward the axis of said tubular member for engaging said substantially planar surface of said needle head, and locking means for bending said flap means radially toward the axis of said tubular member into engagement with the needle head and for retaining said flap means in such engagement.

4,329,988
PLURAL INJECTION ASSEMBLY

Stanley J. Sarnoff, and Claudio Lopez, both of Bethesda, Md., assignors to Survival Technology, Inc., Bethesda, Md.

Filed Dec. 23, 1980, Ser. No. 219,488
Int. Cl.[3] A61M 5/00
U.S. Cl. 128—218 F 6 Claims



1. A plural injection assembly comprising

a plurality of separate injectors capable of separate actuation, each injector comprising an exterior housing having a needle, a medicament dosage and a stressed spring assembly mounted therein in cooperating relation such that upon actuation of the injector the associated stressed spring assembly is released to move the associated needle into the muscle tissue of a user and the associated medicament dosage outwardly through the needle into the muscle tissue and an arming member mounted for movement from (1) a normal position exposed exteriorly with respect to the associated housing and operatively connected with the associated stressed spring assembly for preventing actuation of said injector and release of the associated stressed spring assembly and into (2) a separated position with respect to both the associated housing and the associated stressed spring assembly for enabling the latter to be released upon actuation of the associated injector, and

a holder mounted in retaining engagement with each arming member and in removable supporting relation over an adjacent portion of each housing so as to stably support said injectors together with a substantial portion of their housings exposed in a convenient position to be sequentially grasped by one hand of a user when said holder is grasped by the other hand thereby enabling the user to manually remove from said holder each injector in an armed condition ready for actuation and release of the stressed spring assembly thereof by virtue of the retention of the associated arming member in engagement with said holder.

4,329,989
LIQUID DISPENSER

Robert E. Dallons, Agoura, and William S. Fortune, Malibu, both of Calif., assignors to Edsyn, Inc., Van Nuys, Calif.

Filed Feb. 23, 1981, Ser. No. 237,219
Int. Cl.[3] A61M 5/00
U.S. Cl. 128—218 R 8 Claims

1. In combination with a syringe of the type including a hollow cylinder, a piston in said cylinder, an actuating rod connected to said piston for operating it, and a blunt needle connected to said cylinder for dispensing a liquid in said cylinder;

a needle assembly comprising:

(a) a stop means near the free end of said needle and extending radially therefrom;

(b) a cap, retainer strap and retainer sleeve, said retainer sleeve having such an inner diameter as to freely ride over said needle between said stop means and said cylinder, said retainer strap interconnecting said retainer sleeve and said cap, and said cap having an opening to fit over said stop means and a bore extending into said opening, said bore being of such a diameter as to fit over the free end of said needle, and said cap having a closed end portion, whereby said cap is capable of sealing the free end of said needle and containing a liquid in said cylinder.

4,329,990
EXPANDING SWAB APPLICATOR

Vincent R. Sneider, 3422 Hallcrest Dr., NE., Atlanta, Ga. 30319

Filed Aug. 7, 1980, Ser. No. 176,105
Int. Cl.[3] A61M 3/00
U.S. Cl. 128—239 23 Claims

1. A swab applicator for use as a vaginal cleansing instrument or the like, an including:

(a) an elongated, generally hollow tubular nozzle having an entering and distal end including means on said elongated nozzle and opposite the entering end for attaching the nozzle so as to be in fluid communication with an appropriate liquid dispenser;

(b) a swab body of absorbent, expandable material disposed generally at the distal end of said nozzle and in fluid communication therewith, and

(c) a cage providing retaining means for the swab body, said cage disposed within said distal end of the nozzle with the cage having a plurality of generally equally spaced elongated ribs which extend generally in the longitudinal direction of the nozzle and defining a plurality of slots therebetween and through which said swab body can expand when wetted and with the ends of the ribs brought into a smooth rounded end portion at the distal entering end, this rounded end adapted to prevent injury to the vaginal cavity or the like.

4,329,991
TAMPON

Akira Sakurai, Utsunomiya, Japan, assignor to Kao Soap Co., Ltd., Tokyo, Japan

Filed Sep. 4, 1980, Ser. No. 183,873
Claims priority, application Japan, Oct. 17, 1979, 54-143539[U]
Int. Cl.[3] A61F 15/00
U.S. Cl. 128—263 6 Claims

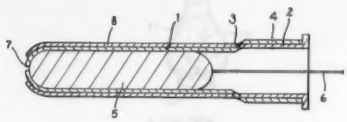
1. A tampon, comprising:

an elongated outer member having a rear portion and a front cylindrical portion which is adapted to be inserted into a va-

gina, said rear portion being laterally enlarged relative to said front cylindrical portion, and a wall extending laterally outwardly from the rear end of said front cylindrical portion to the front end of said rear portion, said wall having one or more holes therethrough;

a mass of absorbent material disposed inside said front cylindrical portion close to the front end thereof and adapted to be moved through said front end of said front cylindrical portion into a vagina;

a push-out member mounted on said elongated outer member for sliding movement in a direction lengthwise thereof, said push-out member having a rear portion slidably disposed inside said rear portion of said elongated outer member, said push-out member having one or more



longitudinally extending push-out pieces corresponding in number to the number of said holes, said push-out piece extending from said rear portion of said push-out member through its associted hole in said elongated outer member and thence forwardly along the outer surface of said front cylindrical portion of said elongated outer member, said push-out piece being receivable inside said elongated outer member when said push-out member is moved longitudinally rearwardly relative to said elongated outer member such that subsequent longitudinal movement of said push-out member in a direction toward the front end of said front cylindrical portion causes said push-out piece to move said mass of absorbent material out of said front cylindrical portion through the front end thereof.

4,329,992

MEDICAL APPARATUS FOR PARENTERAL LIQUIDS

Udo Becker, Marburg an der Lahn; Wolfram Busch, Hochheim am Main; Johann P. Fischer, Königstein, and Werner Sommer, Bad Soden am Taunus, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Apr. 8, 1980, Ser. No. 138,553

Claims priority, application Fed. Rep. of Germany, Apr. 10, 1979, 2914463

Int. Cl.³ A61J *1/00*

U.S. Cl. 128—272 **9 Claims**

1. An apparatus for containing a parenteral liquid which comprises a suitable base or support material having a surface layer affixed thereto wherein at least that portion of the surface layer coming into contact with the parenteral liquid is a polymer comprising at least 50 parts by weight of a chloropolyolefin having 15% to 45% by weight chlorine and an average molecular weight in the range of 20,000 to 2,000,000 and 0.01 to 10 parts by weight of glycerol ester of aliphatic fatty acids per 100 parts by weight of the polymer whereby said apparatus exhibits acceptable blood tolerance and non-thrombogenicity with respect to the contained parenteral liquid.

4,329,993

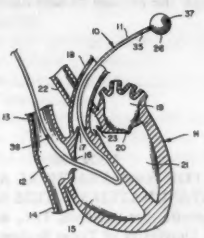
CATHETER WITH TRANS-LUMINAL ELECTRICAL CONDUCTOR

Clement E. Lieber; Robert P. Cooper, both of Yorba Linda, and Michael S. Estes, Irvine, all of Calif., assignors to American Hospital Supply Corporation, Evanston, Ill.

Filed Jun. 18, 1980, Ser. No. 160,600

Int. Cl.³ A61M *25/00*

U.S. Cl. 128—349 B **6 Claims**



1. A catheter comprising a catheter body having an elongated tubular wall formed of flexible material and having proximal and distal ends; pressure responsive means mounted upon said body adjacent the distal end thereof; said body having a first lumen extending from said proximal end to said distal end and communicating with said pressure responsive means for exposing said means to gas pressure within said first lumen; said body also having a second lumen parallel with said first lumen and having a longitudinal septum separating said first and second lumens; a port in said wall of said body communicating with said second lumen and being located intermediate said distal and proximal ends; an aperture in said septum; at least one electrical lead extending through the portion of said first lumen proximal to said aperture and through said aperture into the portion of said second lumen distal to said aperture; electrical means mounted upon said catheter distal to said port and connected to said lead; and a sealant plug means disposed within said second lumen and providing a fluid-tight barrier within the second lumen on the distal side of said port to block liquid from entering the portion of said second lumen distal to said port and from entering said first lumen through said aperture.

4,329,994

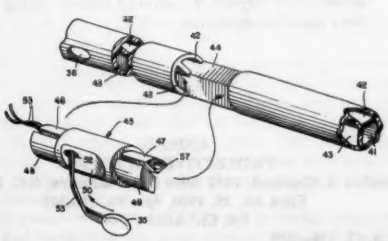
MULTILUMEN CATHETER

Robert P. Cooper, Yorba Linda, Calif., assignor to American Hospital Supply Corporation, Evanston, Ill.

Filed Jun. 18, 1980, Ser. No. 160,749

Int. Cl.³ A61M *25/00*

U.S. Cl. 128—349 B **27 Claims**



1. A catheter comprising a catheter body having an elongated tubular wall formed of flexible material and having proximal and distal ends; pressure responsive means mounted

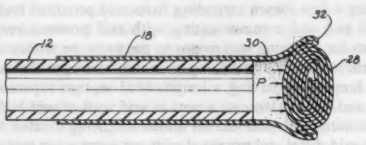
upon said body adjacent the distal end thereof; said body having a lumen extending from said proximal end to said distal end and communicating with said pressure responsive means; said body also having a recess in the wall thereof proximal to said means and communicating with said lumen; a plug disposed within said recess and sealed to said body to prevent liquid flow into said lumen through said recess; said plug having a longitudinal passage for the flow of gas therethrough; and an electrical element sealed in said plug and having electrical conducting means associated therewith and extending from said plug through the portion of said lumen proximal to said plug.

4,329,995

CATHETER FOR NASOTRACHEAL ASPIRATION OF UNCONTAMINATED SPUTUM SPECIMENS

Nancy E. Anthracite, San Antonio, Tex., assignor to Board of Regents, The University of Texas System, Austin, Tex.

Filed Aug. 29, 1980, Ser. No. 182,711
Int. Cl.³ A61M *25/00*
U.S. Cl. 128—350 R **7 Claims**



1. Apparatus for nasotracheal aspiration, which comprises:
an outer flexible catheter means adapted for passage through the nasopharynx and into the trachea, the catheter having a lumen therethrough;
a length of flexible tubing having a first section attached to the distal end of the outer catheter, a second section adjacent said first section forming an expandible cuff portion external to the lumen of said outer catheter and a removing section being rolled-up over its length and inverted into said cuff portion external of the outer catheter lumen to seal the lumen of the outer catheter;
means for introducing fluid under pressure through the lumen of the outer catheter and into the interior of the flexible tubing to expand the cuff portion thereof and cause the rolled-up portion of the tubing to evert and unroll; and
an inner catheter slidably disposed within the outer catheter for passage through the lumen of the outer catheter and advancement beyond the unrolled flexible tubing to perform bronchial aspiration.

4,329,996

PROTECTIVE PACIFIER

Stephen A. Copeland, 1832 Alice Dr., Charleston, S.C. 29407

Filed Jul. 28, 1980, Ser. No. 143,349
Int. Cl.³ A61J *17/00*
U.S. Cl. 128—359 **2 Claims**

1. A selectively reversible and sanitary pacifier which comprises a base member having a solid resilient nipple attached thereto and extending outwardly from one side thereof, and having handle means extending outwardly from the other side thereof, a cap member formed with a hollow portion slightly larger than said nipple and having a configuration for selectively receiving and covering said solid resilient nipple, and means formed on said cap member and said base member for selectively and alternatively attaching said base member to said cap member at a first dispostion at which said resilient nipple extends into and is covered by said cap member with said

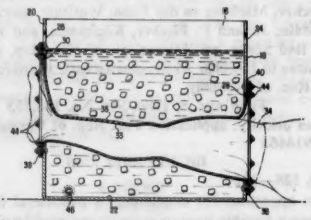
handle means being exposed and at a second disposition at which said resilient nipple extends outwardly away from said cap member in an exposed manner for use, said attaching means including cooperating projection means arranged on said cap member and said base member to engage one another and hold the cap member and base member together at all relative positions thereof except one predetermined relative position at which said projection means may be disengaged to permit separation of said base member and said cap member.

4,329,997

COLD/HOT COMPRESSION AND ELEVATION APPARATUS

H. Donn de Yampert, 3216 Hamilton, El Paso, Tex. 79930, and Sergio Renteria, 4504 Avenue A., Austin, Tex. 78751

Filed May 23, 1980, Ser. No. 152,738
Int. Cl.³ A61F *7/00*
U.S. Cl. 128—402 **6 Claims**



1. A device for treating an injured body limb, which comprises:
a tank adapted to contain a fluid and including first and secured to said second end wall; and
tubular means connected to and extending between said end walls of said tank for encircling and compressing said injured limb within the fluid contained in said tank, said tubular means comprising a liquid-impervious, flexible

tube having an inner tubular surface adapted to contact said limb and an outer tubular surface adapted to contact said fluid; and

wherein said first end wall of said tank includes a limb-receiving aperture formed therein and wherein said flexible tube includes first and second ends, said first end of said tube secured to the periphery of said limb-receiving aperture in said first end wall, said second end of said tube secured to said second end wall; and

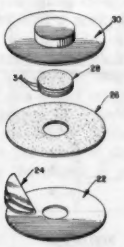
wherein said second end of said tube is connected to second end wall of said tank at a position higher than that of said aperture in said first end wall whereby a limb positioned in said tube will be elevated.

4,329,998
Patent Not Issued For This Number

4,329,999
PATIENT ATTACHED PATCH AND METHOD OF MAKING

Michael Phillips, Talcott Forest Rd., Apt. 3E, Farmington, Conn. 06032

Filed Mar. 3, 1980, Ser. No. 126,882
Int. Cl.³ B32B *31/18*
U.S. Cl. 128—760 **52 Claims**



1. A method of forming a test patch for use in clinical studies including the steps of:

cutting a first portion of material;

defining a hole in said portion of material;

placing a strip of adhesive tape on said first portion of material to cover said hole;

heat shaping said strip covered first portion and forcing the adhesive surface of the adhesive tape through said hole;

placing an absorbent pad on the adhesive surface forced through said hole;

forcing said pad covered adhesive surface back through said hole so that said pad is located within a chamber defined by said adhesive strip;

cutting a second portion of material;

cutting a third portion of material;

folding said third portion of material;

attaching said folded portion of material to said second portion of material;

applying a length of adhesive tape to said second and third portions of material;

defining an access hole through said length of adhesive tape and said second portion of material;

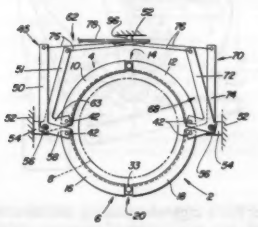
removing said chamber containing adhesive tape from said first portion of material; and

applying said chamber containing adhesive tape to said second portion of material so that said access hole is aligned with said chamber to form a combined portion of material.

4,330,000
GRATE ADJUSTING ARRANGEMENT FOR AN AXIAL FLOW ROTARY THRESHER

Rolf W. Peiler, Zweibrucken, Fed. Rep. of Germany, assignor to Deere & Company, Moline, Ill.

Filed Nov. 20, 1980, Ser. No. 208,618
Claims priority, application Fed. Rep. of Germany, Dec. 17, 1979, 2950722
Int. Cl.³ A01F *12/28*
U.S. Cl. 130—27 L **8 Claims**



1. An axial flow rotary separator comprising:

a frame;

a rotor rotatably supported by the frame and having a threshing section;

a housing supported by the frame and surrounding the rotor so as to define an annular space and including at least one articulated grate portion at least partially wrapping the threshing section of the rotor and including two arcuate side-by-side axially extending panels and means for hingedly coupling the panels for pivoting movement of one panel relative to the other about a hinge axis parallel to the axis of the rotor;

linkage means carried by the frame and pivotally connected to and supporting the grate portion only at a pair of spaced connecting points, one on each panel and remote from the hinge axis, and operable to adjust the radial spacing between the rotor amd the grate portion and so articulated that actuation of the linkage results in biasing

the connecting points in approximately symmetrical non-radial respective directions with respect to the rotor axis so that relative pivoting between the grate panels is in a direction tending to equalize changes in radial spacing between the rotor and circumferentially spaced points on the respective panels resulting from such adjustment; and

means for rotating the rotor and for engaging crop material in the annular space so that when crop material is introduced into the annular space, the rotor cooperates with the housing to propel the material in a generally spiral path while threshing the material, the adjustability of the grate portion providing for controlling the efficiency of the threshing action.

4,330,001

CIGARETTE MAKING MACHINE HOPPER

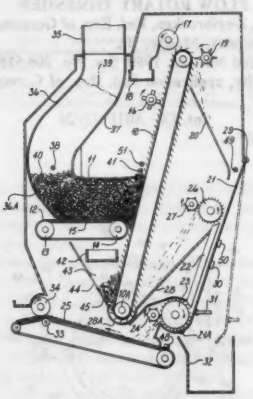
Brian A. Hodsall, London, England, assignor to Molins Limited, London, England

Filed Mar. 11, 1980, Ser. No. 129,305

Claims priority, application United Kingdom, Mar. 16, 1979, 7909303

Int. Cl.³ A24C *5/39, 5/14*

U.S. Cl. 131—108 **8 Claims**



1. A hopper for a cigarette-making machine comprising

(a) an elevator having a surface for receiving and carrying a stream of tobacco upwardly;

(b) conveying means for conveying a carpet of tobacco along a path towards said elevator to a position immediately adjacent said elevator surface for transfer of said tobacco directly from said conveying means to said elevator surface;

(c) means for forming said tobacco carpet of substantially uniform, predetermined height on said conveying means at a further position along said path spaced from said elevator; and

(d) a position-sensing device connected to said conveying means and mounted at a position adjacent said elevator surface for detecting an increase in the height of the upper surface of said tobacco carpet near said elevator surface which indicates that said tobacco in said carpet is starting to roll and, upon detection of said height increase, for automatically stopping or reducing the speed of said conveying means and the conveyance of said tobacco carpet towards said elevator.

4,330,002

METHOD OF PRODUCING CHEROOTS AND SIMILAR TOBACCO ARTICLES AND AN APPARATUS FOR CARRYING OUT THIS METHOD

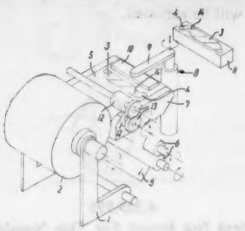
Ian Kjaer, Hadsund, and Niels E. Mortensen, Gistrup, both of Denmark, assignors to Skandinavisk Tobakskompagni A/S, Søborg, Denmark

Filed Jun. 10, 1980, Ser. No. 158,130

Claims priority, application Denmark, Jun. 19, 1979, 2560/79

Int. Cl.³ A24B *5/14, 5/16;* A24C *1/00*

U.S. Cl. 131—365 **3 Claims**



1. An apparatus for preparing a wrapper for cheroots and similar tobacco articles, said wrapper having end flaps and being cut out from natural tobacco leaf and having parts of the side rib of the leaf therein, said apparatus comprising a side rib flattening means to flatten a moist cutout wrapper such that the side ribs are flattened exclusively in the end flap of the wrapper, said side rib flattening means comprising a rotatable roller and an associated base.

4,330,003

SELF-PROPORTIONAL FLUID METERING DEVICE ACTUATED BY A PRESSURIZED FLUID

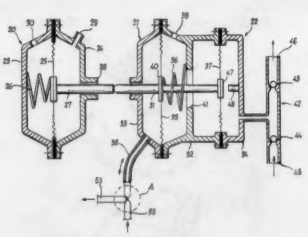
Lodovico D'Alonzo, No. 27, Largo Alessandro Vessella, Rome, Italy

Continuation of Ser. No. 107,682, Dec. 27, 1979, abandoned. This application May 26, 1981, Ser. No. 267,106

Claims priority, application Italy, Jan. 5, 1979, 47545 A/79

Int. Cl.³ G05D *11/13*

U.S. Cl. 137—100 **3 Claims**



1. A fluid metering device, comprising,

detecting means for detecting the flow rate of a first fluid in a conduit;

amplifier means operatively connected to said detecting means for delivering a pneumatic pressure which is dependent on the flow rate of said first fluid as detected by the detecting means;

a control unit having a control diaphragm, a control shaft and a first spring, said control diaphragm being exposed to and urged by said pneumatic pressure against said first spring, said control shaft being connected to said control diaphragm;

a motor unit having a motor diaphragm, a motor shaft and a second spring, said motor diaphragm having one face thereof exposed to a hydraulic fluid which periodically urges the diaphragm against the action of said second spring; said motor shaft being connected to said diaphragm and being operatively engageable by said control shaft;

a pumping unit having a pump diaphragm and a stop member, said pump diaphragm being connected to the motor shaft, said stop member being positioned to abut the motor shaft when the motor shaft is given a maximum displacement by said control shaft and said first spring means; said control shaft comprising a variable stop member whose position is dependent upon the flow rate of said first fluid, said position determining the displacement of said pump diaphragm; and

a continuously operating modulating means operating at a substantially constant speed for periodically supplying hydraulic pressure to said motor unit to cause said pump diaphragm to pump a second fluid with a pumping action which is dependent on said pneumatic pressure and thus on the flow rate of said first fluid.

4,330,004

ELECTROMAGNETIC VALVE

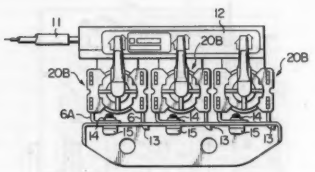
Kiyotosi Yano, Chiryu; Eizi Ishikawa, Nagoya, and Shigeru Yoshiyama, Kariya, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Jun. 10, 1980, Ser. No. 158,274

Claims priority, application Japan, Jul. 11, 1979, 54/95233[U]

Int. Cl.³ F16L *3/00*; F16K *31/02*

U.S. Cl. 137—343 **4 Claims**



1. An electromagnetic valve adapted to be secured to a mounting bracket, said valve comprising yoke means which includes a pair of projecting elements formed in the body of said valve to protrude outwardly from the mounting side thereof, one of said projecting elements having at its outward end a pawl provided with a preformed bend, and the other projecting element having at its outward end a preformed substantially right angle bend extending towards said one projecting element and having a threaded aperture formed therein, said bend of said one of said projecting elements being adapted to engage the bracket when said bends are brought in contact therewith, said valve further comprising a pair of terminals which are provided in the body of said valve to protrude outwardly therefrom at positions other than said mounting side.

4,330,005

HOSE STORAGE APPARATUS

Torben Kjarsgaard, 9233 Scotmont Dr., Tujunga, Calif. 91042

Filed Mar. 3, 1980, Ser. No. 126,428

Int. Cl.³ B65H *75/18*

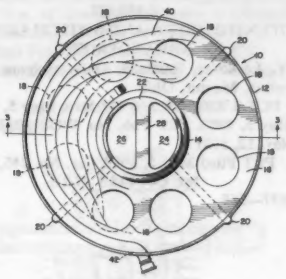
U.S. Cl. 137—355.28 **9 Claims**

1. A storage device for cooperation with an associated hose which comprises:

a band shaped peripheral member having an axis;

an upstanding truncated conical member disposed in generally coaxial relationship with said band shaped member;

a wall extending intermediate a first axial extremity of said band shaped member and a first axial extremity of said truncated conical member, said wall having a plurality of holes disposed therein; and



a handle formed in a second axial extremity of said truncated conical member, said handle comprising at least one aperture in a second axial extremity of said truncated conical member.

4,330,006

DAMPING DEVICE FOR CHECK VALVES

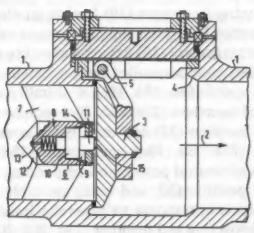
Werner Eck, Herzogenaurach, and Jürgen Hoffmann, Erlangen, both of Fed. Rep. of Germany, assignors to Kraftwerk Union Aktiengesellschaft, Mulheim an der Ruhr, Fed. Rep. of Germany

Filed Aug. 13, 1980, Ser. No. 177,711

Claims priority, application Fed. Rep. of Germany, Aug. 16, 1979, 2933265

Int. Cl.³ F16K *15/03, 47/00*

U.S. Cl. 137—514 **3 Claims**



1. Damping device for a check valve in liquid lines having a closure member movable by liquid flow and disposed on a flap seat in closed condition of the valve, and a damping unit with throttling surfaces separated from respective surfaces of the flap seat, the damping unit including a pair of opposing damping elements in the form of a cylinder and a piston with a piston plunger, on the one hand, and a stop for the piston plunger, on the other hand, one of the damping elements being connected to the closure member, and the other of the damping elements being connected to the flap seat, the cylinder being formed with a chamber wherein the piston with the piston plunger is longitudinally movably mounted so that the piston plunger extends out of the chamber and is engageably with the stop just before the closure member reaches the position thereof in which the valve is in the closed condition thereof, thereby moving the piston within the cylinder chamber, the chamber being closed nearly on all sides thereof and being filled with liquid, and a restoring spring disposed between the piston and a base location of the cylinder so as to exert a force on the piston plunger in direction toward the closure member, comprising arm means for holding the damping element connected with the flap seat centrally within the interior of a liquid line,

the cylinder chamber having a cross section increasing toward the side thereof facing toward the stop.

4,330,007

POTENTIOMETER AND SWITCH CONTROL ARRANGEMENT

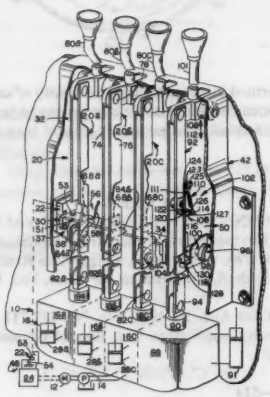
Edward V. Leskovec, Eastlake, Ohio, assignor to Towmotor Corporation, Mentor, Ohio

PCT No. PCT/US80/00519, § 371 Date May 5, 1980, § 102(e) Date May 5, 1980, PCT Pub. No. WO81/03209, PCT Pub. Date Nov. 12, 1981

PCT Filed May 5, 1980, Ser. No. 245,237

Int. Cl.³ F15B *13/08*

U.S. Cl. 137—565 **9 Claims**



1. In a hydraulic system **(10)** having an electric motor **(12)** driving a pump **(14)** which supplies pressurized fluid to a control valve arrangement **(16)** having a plurality of control valves **(16*a*, 16*b*, 16*c*)** each controlled by movement of a corresponding control spool **(18*a*, 18*b*, 18*c*)**; a plurality of longitudinally movable rod members **(20*a*, 20*b*, 20*c*)** each having a rod member neutral position **(32)** and each being connected to one of said spools **(18*a*, 18*b*, 18*c*)**, said spools **(18*a*, 18*b*, 18*c*)** each having a spool neutral position corresponding to the rod member neutral position **(32)** and being movable from said spool neutral position in response to generally longitudinally movement of a respective rod member **(20*a*, 20*b*, 20*c*)** from said rod member neutral position **(32)**; a single switch **(22)** having first and second position, one of said positions being open and the other being closed; a circuit **(24)** controllably supplying power to said motor **(12)**, said circuit **(24)** supplying a relatively greater amount of electric power to said motor **(12)** and causing the output of said pump **(14)** to increase in response to said switch **(22)** being moved to a selected one of said first and second positions, the improvement comprising:

an elongated actuating member **(34)** having a neutral position **(51)** and a rotated position **(52)**;

means for mounting said elongated actuating member **(34)** transverse to said rod members **(20*a*, 20*b*, 20*c*)** and for pivoting about an axis **(40)** generally orthogonal to said rod members **(20*a*, 20*b*, 20*c*)**, said axis **(40)** being generally in a plane **(67)** which is generally parallel to said rod members **(20*a*, 20*b*, 20*c*)**;

means **(56)** for biasing said actuating member **(34)** in a direction towards said neutral position **(51)**;

means **(60)** for engaging said rod member **(20*a*, 20*b*, 20*c*)** and said actuating member **(34)** for pivoting said actuating member **(34)** in one direction **(50)** from said neutral position **(51)** towards said rotated position **(52)** in response to longitudinal movement of one of said rod members **(20*a*, 20*b*, 20*c*)** in either direction from said neutral position **(51)**; and

means **(48)** for positioning said switch **(22)** in said selected one of said first and second positions in response to said actuating member **(34)** being at said rotated position **(52)**.

8. In a hydraulic system **(10)** having an electric motor **(12)** driving a pump **(14)** which supplies pressurized fluid to a control valve **(88)** having a control spool **(90)** controlled by movement of a generally longitudinally movable rod member **(92)**, said rod member **(92)** being movable in a first **(108)** and a second **(112)** direction, a control element **(100)** adjacent said rod member **(92)**, means **(102)** for moving said control element **(100)** in response to generally longitudinal movement of said rod member **(92)**, means **(96)** for varying the amount of electric power supplied to said motor **(12)** in response to movement of said control element **(100)** and means **(128)** for preventing said control element **(100)** from being moved in one direction beyond a preselected position, the improvement comprising:

means **(110)** for permitting said rod member **(92)** to continue to move in said second longitudinal direction **(112)** after said control element **(100)** is at said preselected position.

4,330,008

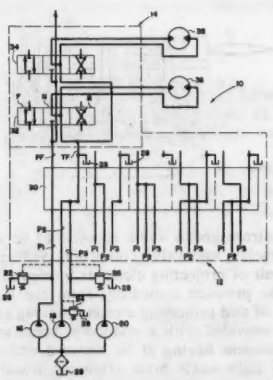
MULTIPLE FLOW AND DIRECTIONAL CONTROL VALVE

Michael Skelly, Rte. 5-Canyon Oaks-Box 2-4, Claremore, Okla. 74017

Continuation-in-part of Ser. No. 929,312, Jul. 31, 1978, Pat. No. 4,219,049. This application Nov. 20, 1979, Ser. No. 96,058

Int. Cl.³ F15B *13/08, 13/09*

U.S. Cl. 137—596.13 **4 Claims**



1. A multiple flow directional control valve comprising three spaced-apart first, second and third valve body members, a plurality of fluid inlet ports provided in the first valve body member, a pair of passageways provided in the second valve body member, one being a power passageway bore and the other being an exhaust passageway bore, three outlet ports provided in the third valve body member comprising first and second working outlet ports and an exhaust outlet port, a fourth valve body member sealingly and movably interposed between said first and second valve body members, means carried by the said fourth valve body member to operably connect a plurality of combinations of said inlet ports into open communication with the power passageway bore of the second valve body member while simultaneously operably connecting the remaining inlet ports into open communication with the exhaust passageway bore, a fifth valve body member sealingly and movably interposed between the second and third valve body members, means carried by the fifth valve body member such that in a first position thereof to operably connect the power passageway bore into communication with the first

working outlet port while simultaneously connecting the second working outlet port into communication with the exhaust outlet port, and in a second position to operably connect the power passageway bore into communication with the second working outlet port while simultaneously connecting the first working outlet port into communication with the exhaust port.

4,330,009

EXHAUST PRESSURIZATION OF LOAD RESPONSIVE SYSTEM

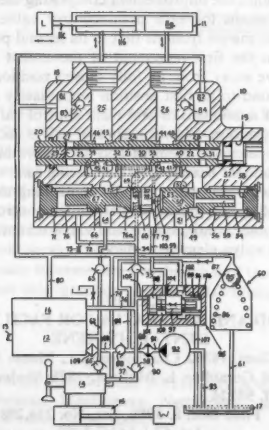
Tadeusz Budzich, 80 Murwood Dr., Moreland Hills, Ohio 44022

Continuation-in-part of Ser. No. 49,660, Jun. 18, 1979, Pat. No. 4,249,570, and Ser. No. 960,767, Nov. 15, 1978, Pat. No. 4,209,039. This application Nov. 27, 1979, Ser. No. 97,851

The portion of the term of this patent subsequent to Feb. 10, 1998, has been disclaimed.

Int. Cl.³ F15B *13/08*

U.S. Cl. 137—596.13 **10 Claims**



1. A valve assembly supplied with pressure fluid by a pump having inlet port means and outlet port means, said valve assembly comprising a housing having a fluid inlet chamber connected to said outlet port means, at least one load chamber, and exhaust means connected to reservoir means, first valve means for selectively interconnecting said load chamber with said inlet chamber and said exhaust means, signal port means in said housing selectively communicable with a source of pressure by said first valve means, charging pump means having discharge port means connected to said inlet port means of said pump and suction port means connected to said reservoir means, check valve means interposed between said inlet port mens and said discharge port means and operable to connect for one way fluid flow said charging pump means and said inlet port means and second valve means interposed between said discharge port means and said reservoir means upstream of said check valve means having means responsive to pressure in said signal port means and means to unload said charging pump means.

4,330,010

APPARATUS FOR THE LEAKAGE-FREE CONNECTION OF CAVITIES IN TUBES AND VESSELS

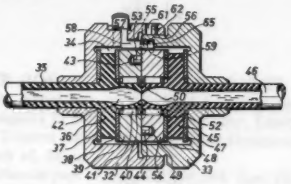
Wolfgang Drescher, and Eilt-Heyo Rittberg, both of Wilhelmshaven, Fed. Rep. of Germany, assignors to Olympia Werke AG, Wilhelmshaven, Fed. Rep. of Germany

Filed Feb. 25, 1980, Ser. No. 123,973

Claims priority, application Fed. Rep. of Germany, Feb. 26, 1979, 2907457

Int. Cl.³ F16L *37/28, 55/14*

U.S. Cl. 137—614.06 **4 Claims**



1. In a coupling device for establishing a leakage-free connection between the interiors of two enclosures to permit the passage of fluid therebetween, which device includes two coupling tubes each arranged to be in communication with the interior of a respective enclosure and each defining a controllable closing member formed to present a closeable flow passage in its respective tube, the tubes being engageable against one another in a position to establish a leakage-free connection between their flow passages, and two operating members each operatively associated with a respective closing member and movable relative to its associated closing member between a position in which the associated flow passage is closed and a position in which the associated flow passage is open, the improvement wherein one of said operating members is provided with a coupling projection and the other of said operating members is provided with a recess formed to mate with said projection for causing said operating members to move in unison between said positions when said tubes are in the position to establish a leakage-free connection between their flow passages, and said device further comprises: two cylindrical housings; means supporting a respective coupling tube and operating member in each said housing, each said operating member being disposed concentrically about its associated closing member and being constructed to undergo rotational movement between its positions; bayonet closure means for connecting said housings together and composed of a groove and a pin each provided on a respective one of said housings in such a manner that engagement of said pin in said groove places said coupling tubes in engagement against one another; a manual actuating member engageable with one of said operating members when said housings are connected together by said closure means for moving said operating members between their said positions; and wherein one of said housings is provided with a groove through which said actuating member extends to a location outside of said housings and the other of said housings presents an abutment surface arranged such that when said housings are connected together and said operating members are in said position for opening said flow passages, engagement between said actuating member and said abutment prevents disconnection of said housings.

4,330,011

FAUCET VALVE WITH EARLY SHUTOFF

Alfred M. Moen, Grafton, Ohio, assignor to Stanadyne, Inc., Windsor, Conn.

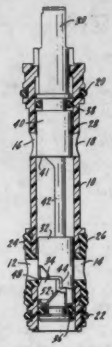
Filed Jun. 19, 1980, Ser. No. 161,049

Int. Cl.³ F16K *11/02*

U.S. Cl. 137—625.17 **5 Claims**

1. In a valve having a sleeve with axially spaced inlet and outlet ports, a valve member movable within said sleeve to

control flow from said inlet to said outlet port, seal means at said inlet port positioned by said sleeve and extending through said inlet port into sealing contact with said valve member, said valve member having a first portion adjacent said inlet port to control flow therethrough and a second portion adjacent said outlet port to control flow therethrough, said second portion comprising a cylindrical area substantially the same in diameter



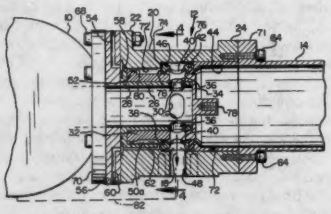
as the interior area of the sleeve through which it moves, said first and second portions being axially spaced apart a distance such that movement of said valve member toward a closing position causes said second portion to close said outlet port before said first portion closes said inlet portion thereby reducing pressure on said seal means at closure of said inlet port by said first portion.

4,330,012

VALVE FOR AERIAL SPRAYING

Russell D. Chadwick, 6125 SW. 152nd Ave., Beaverton, Oreg. 97140

Filed Jul. 21, 1980, Ser. No. 170,889
Int. Cl.³ F16K *11/07*
U.S. Cl. 137—625.48 **27 Claims**



1. A valve suitable for mounting in an aircraft for controlling fluids for agricultural spraying, said valve comprising:

a housing provided with a bore defining a cavity having a substantially closed end except for a tubular member extending coaxially into said cavity from said end for providing a fluid flow passage,

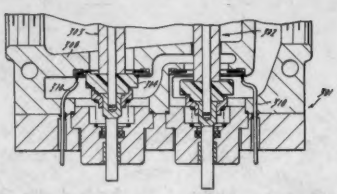
and a slide member having a first end received coaxially between said bore and said tubular member forming an actuating means toward said substantially closed end of said cavity, said slide member being closed on its second end and having side openings to form valving means with said tubular member for providing selective communication of fluid between said tubular member and said bore in accordance with the axial position of said slide member.

4,330,013

VALVE SAFETY INDICATING MEANS

Russell J. Cameron, Rochester, Mich., assignor to Ross Operating Valve Company, Detroit, Mich.

Division of Ser. No. 11,140, Feb. 12, 1979, Pat. No. 4,227,547, which is a division of Ser. No. 910,492, May 30, 1978, abandoned, which is a continuation of Ser. No. 729,273, Oct. 4, 1976, abandoned. This application Mar. 17, 1980, Ser. No. 131,211
Int. Cl.³ F15B *13/043, 20/00*
U.S. Cl. 137—637.1 **4 Claims**



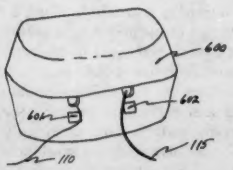
1. In combination with a double valve assembly having pair of piston-operated main control valves, solenoid-operated means for each of said main control valves, the valves being in a closed position when their pistons are depressurized and said solenoids are de-energized, and switch means for each of said main control valves, actuatable between first and second positions when said control valves move between their open and closed positions, the improvement comprising means mounting the switch means for each main control valve so that said switch means moves from its first to its second position immediately upon the first increment of movement of said main control valve away from its fully closed position, and moves from its second to its first position immediately upon the last increment of movement of said main control valve toward its fully closed position, said main control valves each comprising an inlet poppet valve element and a cooperating valve seat, said valve element having a surface facing said valve seat and cooperable with said valve seat for controlling the flow therethrough, and switch means for each main control valve comprising a contact contiguous to said valve seat and engageable by said inlet valve element surface.

4,330,014

METHOD AND APPARATUS FOR FACILITATING DENTAL HYGIENE

Donald R. Glass, 18392 Chadbourne La., Monte Sereno, Calif. 95030, and Geraldine L. McCoid, 1878 Shulman Ave., San Jose, Calif. 95124

Filed Dec. 8, 1980, Ser. No. 214,203
Int. Cl.³ A61C *3/00*
U.S. Cl. 132—89 **2 Claims**



1. A method for facilitating dental hygiene comprising the steps of

providing a container having at least a first and a second flossing material therein, said second material having a plurality of distinct strands;

drawing from said container a preselected length of first flossing material;

drawing from said container a preselected length of said second flossing material;

engaging said length of said first flossing material with said length of said second flossing material so that said length of first flossing material forms a first loop and said length of second flossing material forms a second loop, the first and second loops being interlocked;

severing said first and second loops from said container;

manipulating said first loop in between the teeth and into an interdental area;

drawing upon said first loop to bring the second loop into the interdental area; and

initiating an up and down shoeshine-like motion of said second loop thereby cleansing the teeth surfaces and the gums.

4,330,015

DUCTILE CAST IRON PIPE HAVING CONSTRICTED END CASING

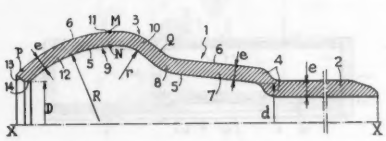
Claude Fuminier, and Michel Pierrel, both of Pont-a-Mousson, France, assignors to Pont-A-Mousson S.A., Nancy, France

Filed May 2, 1980, Ser. No. 146,736

Claims priority, application France, May 17, 1979, 79 12559

Int. Cl.³ F16L *9/02*

U.S. Cl. 138—109 **5 Claims**



1. A pipe or similar tubular member, having a main barrel portion, said pipe being comprised of spheroidal graphite ductile cast iron having an end casing with a constriction at its entrance, said casing having a wall thickness which is substantially constant and substantially equal to that of the main barrel portion of the pipe or tubular member, said casing having at its entrance a median profile in the form of two successive curved sections, one said section adjacent the entrance of the casing having a curvature substantially less than that of the other said section, wherein said graphite is spheroidal throughout the entire member.

4,330,016

PIPE PART PROVIDED WITH A FLANGE

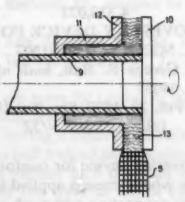
Mannes Grendelman, Hardenberg, Netherlands, assignor to Wavin B.V., Zwolle, Netherlands

Filed Oct. 26, 1979, Ser. No. 88,595

Claims priority, application Netherlands, Oct. 31, 1978, 7810838

Int. Cl.³ G01L *11/12*; F16L *9/12*

U.S. Cl. 138—109 **9 Claims**



1. A pipe part, provided with an integral flange of fiber reinforced plastic material, wherein the integral flange comprises:

a plurality of helically wound, radially superimposed, continuous, fiber reinforcing layers;

wherein the width of the fiber reinforcing layers, immediately before entering a mould for the integral flange, exceeds the width of the finished integral flange; and

wherein the integral flange has, in its final form, one of waves, crinkles, and folds in its helically wound, radially superimposed, continuous, fiber reinforcing layers.

4,330,017

RUBBER HOSE FOR AUTOMOTIVE FUEL LINE

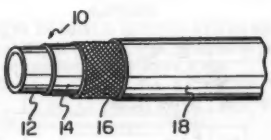
Seikoh Satoh, Yokohama, and Tadashi Suzuki, Gojo, both of Japan, assignors to Nissan Motor Company, Limited, Yokohama and Togawa Rubber Manufacturing Company, Limited, Osaka, both of, Japan

Continuation-in-part of Ser. No. 896,084, Apr. 13, 1978, abandoned. This application Aug. 30, 1979, Ser. No. 71,291

Claims priority, application Japan, Apr. 22, 1977, 52-52133

Int. Cl.³ F16L *9/14*

U.S. Cl. 138—126 **8 Claims**



1. A hose for automotive fuel lines, comprising:

a two-ply rubber tube constituted of an inner layer of a copolymer of hexafluoropropylene with vinylidene fluoride which is resistant to hydrocarbon fuels including sour gasoline, formed by extrusion to serve as an innermost layer of the hose and an outer layer of a synthetic rubber selected from the group consisting of ethylene-acrylic rubber and epichlorohydrin rubber, which is less resistant to said fuels but has a better cold resistance than said fluorine rubber, formed by extrusion so as to bond to said inner layer, said inner layer having a thickness in the range from about 0.2 mm to about 0.7 mm, said outer layer having a thickness in the range from about 0.5 mm to about 1.0 mm and not smaller than the thickness of said inner layer;

a tubular reinforcing layer of a heat-resistant fibrous material intimately covering said outer layer; and

a tubular protective layer of a synthetic rubber intimately covering said reinforcing layer.

4,330,018

SHUTTLE RETURN CONVEYOR MECHANISM

Willem Sterel, Wiesendangen, Switzerland, assignor to Sulzer Brothers Ltd., Winterthur, Switzerland

Continuation of Ser. No. 68,655, Aug. 22, 1979. This application Jan. 13, 1981, Ser. No. 224,735

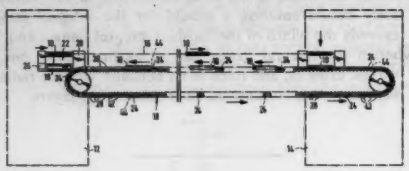
Claims priority, application Switzerland, Aug. 31, 1979, 9192/78

Int. Cl.³ D03D *47/24*

U.S. Cl. 139—439 **13 Claims**

1. An endless conveyor belt for a shuttle return conveyor mechanism, said endless belt having support means on at least

one longitudinal side for laterally supporting a series of shuttles in an upright manner and a plurality of spaced apart drivers for



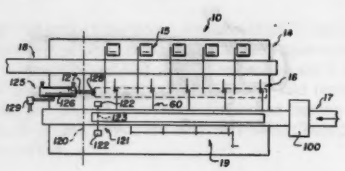
individually abutting each shuttle supported in said support means.

4,330,019

METHOD AND APPARATUS FOR SAWING LOGS INTO LENGTHS

Peter Murphy; David H. King, both of Delta, and Bernard Haeber, Burnaby, all of Canada, assignors to King, Murphy & Associates, Ltd., Richmond, Canada

Filed Jun. 9, 1980, Ser. No. 157,724
Int. Cl.³ A01G *23/02*
U.S. Cl. 144—312 **10 Claims**



1. Apparatus for cutting logs into random lengths in accordance with the respective profiles of the logs to obtain advantageous use of the wood therein, said apparatus comprising:

a plurality of saw units laterally spaced apart and mounted for individual sideways movement along a common path of travel,

drive means for moving each saw unit,

a support structure for supporting a log delivered thereto in a position to be sawn into lengths by the saw units,

locating means for locating an end of the log on the support structure and determining the position of said log end relative to a reference datum line extending across said structure,

scanning means for scanning the log delivered to the support structure whereby to obtain profile data of the log, and

a computer having a memory with desirable cutting data therein; said computer being operatively connected to the locating means, the drive means, and the scanning means whereby the saw units are positioned relative to the reference datum line to cut the log into optimum random lengths.

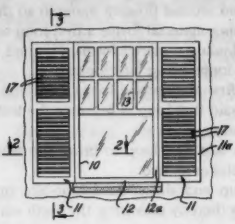
4,330,020

VENTILATING ENTRY-PROOF WINDOW

Thomas J. Glynn, 3923 Foster Ave., Brooklyn, N.Y. 11203

Filed Aug. 24, 1977, Ser. No. 827,432
Int. Cl.³ E06B *3/32*
U.S. Cl. 160—90 **4 Claims**

1. A window comprising an outer frame mountable within an opening in a wall, a pair of louvers mounted at the ends of the frame, a fixed window mounted in the middle of the frame between the louvers, a window mounted within the outer frame behind each louver and a slide mounting for said windows within the outer frame and behind the louvers and the fixed window to permit the windows to be shifted from a closed position directly behind the respective louver to a



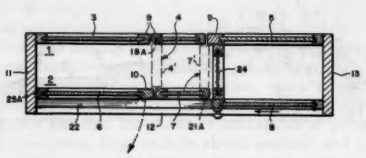
partly open position to an open position directly behind the fixed window.

4,330,021

CONVENIENT DRAFT-FREE SAFETY WINDOW

John J. Deering, Chicago, Ill.

Continuation-in-part of Ser. No. 893,062, Apr. 3, 1978, abandoned. This application Oct. 3, 1979, Ser. No. 81,373
Int. Cl.³ A47H *1/00*; E06B *3/32*
U.S. Cl. 160—91 **8 Claims**



1. A convenient draft-free safety window comprising:

an outer window including an outer center panel and two outer side panels:

an inner window including an inner center panel, an inner side panel, and an inner side ventilating panel;

said outer panels lying adjacent one another when in a closed position to form a closure across a window opening;

said inner panels likewise forming a closure across a window opening when in a closed position;

said center panels pivoting at diagonally opposite edges to open; said inner center panel pivoting outward, thus making the inside glass surface of the outer center panel accessible for cleaning; and said outer center pivoting inward so that its outside surface can be cleaned; and

said center panels having widths less than or equal to the distance between the inner and outer windows so that in fully open position said center panels fit crosswise in the space between inner and outer windows.

4,330,022

TRANSPARENT OVERLAY DEVICE FOR PROTECTING MESH SCREENING

Ada M. Bull, and George R. Bull, both of 1643 Edmonton, Sunnyvale, Calif. 94087

Filed Feb. 28, 1979, Ser. No. 15,932
Int. Cl.³ E06B *9/52*
U.S. Cl. 160—379 **2 Claims**

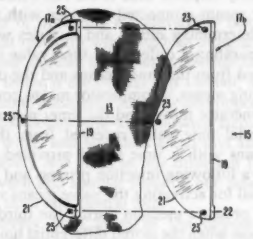
1. A protective overlay device for reinforcing framed mesh screening in an area where stress is applied to the mess screening adjacent a frame supporting said mesh screening comprising:

first and second reinforcing plate members, each member defining opposite parallel faces extending from a single straight edge for abuttment with the frame supporting said

framed mesh screening to an edge out of abuttment with said frame;

a plurality of spaced apart peg members secured to the first plate member to define an integral body therewith, each peg member secured at one of its opposite ends to one of the opposite faces of said first plate member at a fixed location to extend along an axis away from said one opposite face to a free end, each peg member formed to have a circumferential region of reduced axial cross section axially spaced from regions of greater axial cross section at its opposite ends with the region defining the free end of the peg member tapered in the direction of the axis of the peg member from a large axial cross section proximate the reduced axial cross section region to a smaller axial cross section at said free end;

a plurality of apertures defined by the second plate member to extend along an axis from one of the opposite faces of said member in a direction towards the other of said member's opposite faces, said apertures being so dimensioned and spaced as to receive therewithin said peg members



when said plate members are placed together in face-abutting relationship, each of said apertures having a region of reduced axial cross section axially spaced from regions of greater axial cross section at opposite ends of the aperture; and

said regions of reduced axial cross section on said peg members and said apertures having substantially the same axial cross section and said same axial cross section being a smaller axial cross section of each said peg member and aperture than other portions thereof, and said regions of reduced axial cross section being axially positioned respectively on said peg members and in said apertures and the length of each peg member selected such that, when the first and second plate members are assembled with said mesh screening therebetween and said reduced axial cross section regions of said peg members and apertures in mutual engagement, said plate members are relatively immobile with said mesh screening in surface abutting contact with each of said plate members and the free ends of the peg members terminate within the apertures.

4,330,023

EXTENDED NIP PRESS

Dennis C. Cronin, Rockton, Ill., assignor to Beloit Corporation, Beloit, Wis.

Filed Aug. 18, 1980, Ser. No. 179,059

Int. Cl.³ D21F *3/02, 3/08*

U.S. Cl. 162—358 **7 Claims**

1. An extended nip press for removing water from a moving web of material, said press comprising:

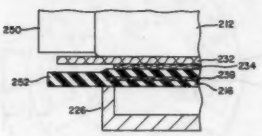
a rotatable roll having a cylindrical outer surface;

a flexible endless belt trained about a plurality of pulleys and having a belt surface such that said belt turns about the surface of said roll over an arc of contact and said belt surface faces said roll;

at least one movable felt means trained about said roll between said belt and said roll for carrying said web of material between said belt and said roll;

a pressure shoe disposed on the side of said belt opposite said roll surface and adjacent said arc of contact, said shoe terminating in lateral directions at edges substantially short of the lateral edges of said belt; and

the surface of the belt adjacent the pressure shoe, and the



surface of the roll opposite the pressure shoe being substantially parallel to each other in the lateral direction, the distance between the surface of the belt and the surface of the roll gradually increasing adjacent the lateral outer edges of the pressure shoe.

4,330,024

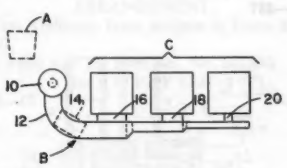
METHOD FOR IN-MOLD DEOXIDATION OF STEEL

John F. Wallace, Shaker Heights, Ohio, assignor to Steel Founder's Society of America, Rocky River, Ohio

Filed Aug. 27, 1980, Ser. No. 181,753

Int. Cl.³ B22D *27/00*

U.S. Cl. 164—56.1 **1 Claim**



1. A method of uniformly deoxidizing molten steel which comprises:

subjecting the molten steel to a preliminary deoxidation treatment in the furnace or ladle;

pouring said preliminarily deoxidized steel into a runner having a chamber depending therebeneath, with said chamber containing an aluminum deoxidizer consisting of 6.5% aluminum-iron pellets and ferrosilicon, with the ratio of said aluminum-iron pellets to said ferrosilicon being between 2:1 and 2:3 by volume and being constructed such that metal turbulence is created in said chamber whereby the available oxygen impurity in said molten metal is caused to uniformly and non-violently react with said aluminum deoxidizer; and

casting the uniformly deoxidized molten metal into molds.

4,330,025

NOZZLE IN A STRIP CASTING APPARATUS

Robert H. Johns, Natrona Heights, Pa., assignor to Allegheny Ludlum Steel Corporation, Pittsburgh, Pa.

Filed Sep. 11, 1980, Ser. No. 185,825

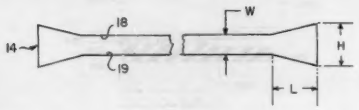
Int. Cl.³ B22D *11/06, 11/10*

U.S. Cl. 164—423 **2 Claims**

1. In a strip casting apparatus wherein molten metal is delivered to a casting surface located within 0.120 inch of the orifice defined in a nozzle and movable past the orifice at a speed of from 200 to 10,000 linear surface feet per minute, wherein

said nozzle comprising:

a pair of spaced orifice lips substantially parallel to and facing one another, said spacing being substantially uniform throughout the substantial longitudinal extent thereof, and a pair of edge surfaces substantially parallel to one another and substantially perpendicular to said pair of spaced orifice lips and defining the orifice with said pair of spaced orifice lips, and



the end portions of said orifice lips continuously diverging outwardly from one another to said edge surfaces for a length of less than about three times the substantially uniform spacing between lips, and for a total height of each of said edge surfaces of less than about twice the substantially uniform spacing between lips.

4,330,026

METHOD AND DEVICE FOR CONTROLLING INJECTION PROCESS IN COLD-CHAMBER DIE-CASTING MACHINES

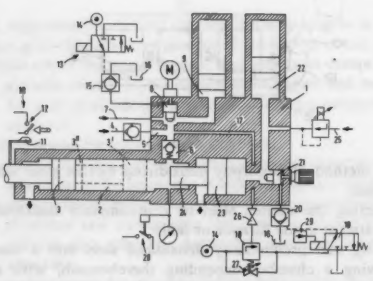
Roland Fink, Winterbach, Fed. Rep. of Germany, assignor to Oskar Frach Werkzeugbau GmbH & Co. KG, Winterbach, Fed. Rep. of Germany

Filed Jun. 6, 1980, Ser. No. 157,155

Claims priority, application Fed. Rep. of Germany, Jun. 6, 1979, 2922914

Int. Cl.³ B22D *17/32*

U.S. Cl. 164—457 **9 Claims**



1. A method of controlling an injection process in cold-chamber die-casting machines, the method comprising the steps of filling a mold up to a slug with a die-casting medium in a first phase of the injection process, injecting the die-casting medium into an end mold with a pressure rise in a second phase of the injection process, multiplying the pressure in the filled mold during a third phase of the injection process, and controlling the individual phases as a function of travel of a plunger of the die-casting machine characterized by measuring a time interval, beginning with the plunger at a certain starting position, which elapses until a pressure in a working cylinder ahead of the plunger reaches a predetermined value, determining a response time delay of a valve means for controlling a supply of the pressure medium in the third phase, subtracting the response time delay from the time interval so as to obtain a time differential value, triggering the valve means for controlling the supply of pressure medium in the third phase of the injection process in response to the time differential value which elapses after the injection molding process begins with the plunger in the starting position.

4. An apparatus for controlling an injection process in a cold-chamber die-casting machine wherein a mold is filled with a die casting medium in a first phase of the injection process, the apparatus comprising a working cylinder, a plunger means displaceably mounted in the working cylinder for injecting the die-casting medium into an end mold with a pressure rise during a second phase of the injection process, multiplying piston means acted upon by a pressure medium and cooperable with the plunger means so as to increase the pressure in the end mold during a third phase of the injection process, valve means for controlling a supply of pressure medium acting upon the multiplying piston means, limit switch means actuatable by the plunger means when the plunger means is in a starting position, means for determining a pressure in the working cylinder at a position ahead of the plunger means, a timer means operatively connected with the limit switch means and the pressure determining means in such a manner that the timer means is turned on by the limit switch means and turned off by the pressure determining means so as to provide time signals for each injection process, means for supplying a delay response time of the valve means, a differential generator means connected in series with said delay response time determining means and in series with said timer means for generating a differential time value in response to signals received from the timer means and the delay response time determining means, a comparator means connected to the differential generator means and the timer means for comparing a differential time value received from the differential generator means with a time signal provided by the timer means during a following injection process and for providing an output signal for activating the valve means so as to permit a flow of the pressure medium during the third phase of the injection process when the stored differential time value corresponds to the time signal received from the timer means.

4,330,027

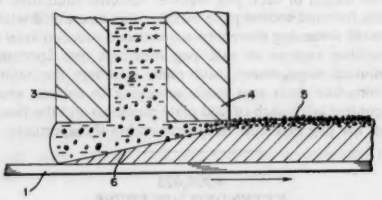
METHOD OF MAKING STRIPS OF METALLIC GLASSES CONTAINING EMBEDDED PARTICULATE MATTER

Mandayam Narasimhan, Flanders, N.J., assignor to Allied Corporation, Morris Township, Morris County, N.J.

Division of Ser. No. 863,114, Dec. 22, 1977, Pat. No. 4,268,564. This application Nov. 17, 1980, Ser. No. 207,170

Int. Cl.³ B22D *11/06*

U.S. Cl. 164—461 **6 Claims**

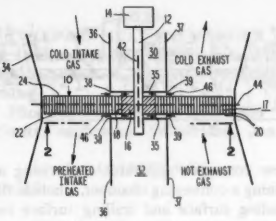


1. The method of forming a continuous strip of amorphous metal containing embedded particulate matter, which comprises: (a) moving a chill body in a longitudinal direction at a constant predetermined velocity within the range of from about 100 to 2000 meters per minute past the orifice of a slotted nozzle defined by a pair of generally parallel lips located proximate to said surface such that the gap between the lips and said surface is from about 0.03 to about 1 millimeter, said orifice being arranged generally perpendicular to the direction of movement of the surface of said chill body; and (b) forcing a stream of molten metal containing dispersed particulate matter through the orifice of the nozzle into contact with the surface of the moving chill body to permit the metal to solidify thereon to form a continuous strip containing embedded particulate matter.

4,330,028
SEAL COLUMN APPARATUS AND METHOD

Vimal K. Pujari, and Jackson P. Trentelman, both of Corning, N.Y., assignors to Corning Glass Works, Corning, N.Y.

Filed Nov. 10, 1980, Ser. No. 205,774
Int. Cl.³ F28D *19/00*
U.S. Cl. 165—1 **15 Claims**



14. A method of operating a counterflow heat exchanger comprising a heat recovery wheel with an integral central hub and two opposing annular faces and supported on a shaft assembly passing through the central axis thereof, a pair of opposing seal columns positioned adjacent said opposing annular faces, said method comprising the following steps:

rotating said wheel and said shaft about said axis;

flowing relatively hot gases in one direction through said wheel between said annular faces on one side of said axis outwardly from said central hub;

flowing relatively cool gases in the opposite direction through said wheel between said annular faces on the opposite side of said axis outwardly from said central hub; and

substantially blocking the flow of gases with said seal columns which form sealing zones extending diametrally across said faces and which are wider than the diameter of said hub so as to maximize the temperature difference between said hot and cool gases which said wheel can withstand by substantially minimizing the maximum radial temperature difference occuring across said annular faces while preventing the failure of said central hub or said shaft assembly from overheating during operation of the system.

4,330,029
MOUNTING DEVICE FOR HEAT RECOVERY WHEELS

Burton A. Noll, Painted Post, and Richard P. Suhey, Horseheads, both of N.Y., assignors to Corning Glass Works, Corning, N.Y.

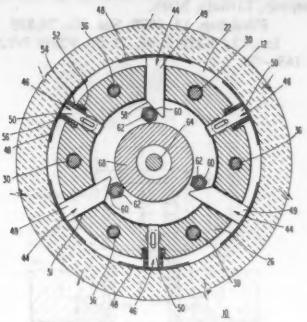
Filed Nov. 10, 1980, Ser. No. 205,779
Int. Cl.³ F28D *19/00*
U.S. Cl. 165—8 **12 Claims**

1. A mounting device for a heat recovery wheel of the type having a ceramic disk with a central bore therein comprising:

a first hub portion on one side of said wheel and axially aligned therewith;

at least three radially movable shoes situated in said bore, and coupled to said first hub portion, said shoes being equiangularly spaced about the periphery of said bore; and

cam-driven means for applying equal radial forces to each of said shoes whereby said shoes are biased against said

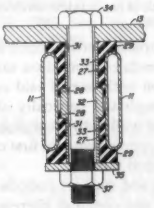


wheel at the periphery of said bore and equally displced from the axis of said wheel.

4,330,030
HEAT EXCHANGER ISOLATION MOUNTING ARRANGEMENT

Robert R. Cate, Dubuque, Iowa, assignor to Deere & Company, Moline, Ill.

Filed Apr. 21, 1980, Ser. No. 141,880
Int. Cl.³ F28F *9/00*
U.S. Cl. 165—67 **3 Claims**



1. In combination with the serpentine tube heat exchanger, a mounting arrangement comprising:

a. a support means for securing said serpentine tube heat exchanger thereto;

b. a plurality of support rings comprised of elastomer material having a hole therethrough and a collar formed at one end, said support rings having a generally cylindrical configuration.

c. a metallic ring bonded to the internal face of said hole of each of said support rings;

d. a spacer ring comprised of a metallic material;

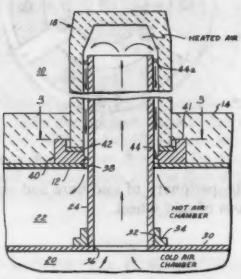
e. clamping means for maintaining co-linear alignment between two of said support rings separated by said spacer ring, such that said collars of said support ring have therebetween the looped portion of said serpentine tube, said clamping means to maintain a compressive loading between said spacers and serpentine tube against said support means.

4,330,031

CERAMIC TUBE RECUPERATOR

Paul K. Shefsiek, Farmington Hills, Mich., assignor to Holcroft & Company, Livonia, Mich.

Filed Sep. 12, 1979, Ser. No. 74,899
Int. Cl.³ F28F 9/06, 21/04; F28D 7/12
U.S. Cl. 165—76 14 Claims



1. A recuperator for recovering energy from hot flue gases which comprises a horizontal flue gas passage, a horizontally extending cold air chamber below said passage, and a horizontally extending hot air chamber interposed between said passage and said cold air chamber, said hot air chamber having a first horizontal common wall with said flue gas passage and a second horizontal common wall with said cold air chamber, said common walls having a multiplicity of pairs of vertically aligned openings,

a corresponding multiplicity of vertical heat exchange units, each of which is associated with one of said pairs of openings,

said units comprising vertical open ended tubes having their lower open ends supported on said second common wall in registration with one of said openings therein and extending through the vertically aligned openings in said first common wall with clearance to provide for air flow through the openings in said first common wall exterior of said open ended tubes,

annular sealing and support pads on said first common wall surrounding the openings therein having exposed upper horizontal surfaces,

outer vertically extending ceramic heat transfer tubes formed of a material capable of withstanding the extremely high temperatures of flue gases, said ceramic tubes having closed upper ends adjacent the top wall of said passage, said ceramic tubes having at their bottom open ends horizontal annular support and sealing surfaces conformed to rest upon said pads, said ceramic tubes surrounding the portions of said open ended tubes within said passage, the closed upper ends of said ceramic tubes being slightly spaced from the upper ends of said open ended tubes and defining therewith annular spaces for the flow of air from the tops of said open ended tubes downwardly to said hot air chamber,

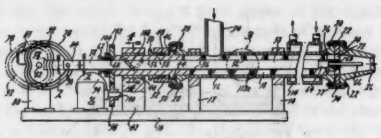
said pads constituting the sole support for said ceramic tubes whereby said ceramic tubes may be readily installed or removed by simple placement or lifting of the ceramic tubes onto or off of said pads through access openings provided in the top wall of said passage.

4,330,032

SELF-CLEANING SCREW CONVEYOR

Edward Koppelman, 4424 Bergamo Dr., Encino, Calif. 91316, and Robert G. Murray, Palo Alto, Calif., assignors to Edward Koppelman, Encino, Calif.

Filed Mar. 12, 1981, Ser. No. 242,831
Int. Cl.³ F28F 17/00
U.S. Cl. 165—94 21 Claims



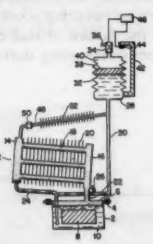
1. A screw conveyor apparatus comprising an elongated housing defining a conveying chamber, a helical flight defining a helical leading surface and trailing surface rotatably supported in said housing having a central axially extending bore through at least a portion of the length thereof, a shaft slidably disposed in said bore and reciprocable and rotatable relative to said helical flight, scraper means on said shaft disposed adjacent to said leading and said trailing surface of said helical flight, drive means for rotating said helical flight and said shaft and power means for reciprocating said shaft and said helical flight relative to each other for effecting traversing movement of said scraper means along said leading and said trailing surface of said helical flight.

4,330,033

CONSTANT PRESSURE TYPE EBULLIENT COOLING EQUIPMENT

Sadayuki Okada, Katsuta, and Hisao Sonobe, Naka, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 5, 1980, Ser. No. 127,391
Claims priority, application Japan, Mar. 5, 1979, 54-24470
Int. Cl.³ F28D 15/00
U.S. Cl. 165—104.27 4 Claims



1. A constant pressure-type ebullient cooling equipment comprising:

a vaporizer which is filled up with refrigerant liquid;

a condenser which condenses refrigerant vapor produced within said vaporizer;

a variable volume type liquid receiver which is located above said condenser and which receives the refrigerant liquid when the refrigerant vapor exists in said condenser;

coupling pipe means for, respectively, connecting said vaporizer and said condenser, and said vaporizer and said liquid receiver;

means for detecting a voluminal change in said liquid receiver and for providing an indication of said change;

outlet means for allowing escape of non-condensable gases located at an upper portion of said liquid receiver;

a valve means for emitting non-condensable gases having gathered in said liquid receiver through said outlet means,

when the amount of non-condensable gases in said receiver has reached a pre-determined amount; and

means for opening and shutting said valve means in response to an indication of a voluminal change in said liquid receiver from said detecting means whereby the internal pressure of said cooling equipment is held substantially constant.

4,330,034

TWO-PASS HEAT EXCHANGER

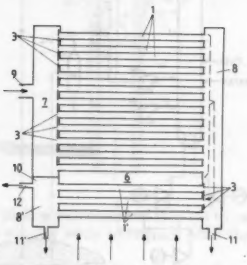
Helmut Lang, Lindenhof 8, 5430 Wettingen, and Peter Wollschlegel, Niederwiesstrasse 4,, CH-5417 Untersiggenthal, both of Switzerland

Filed Jul. 31, 1979, Ser. No. 62,428

Claims priority, application Switzerland, Jun. 20, 1979, 5735/79

Int. Cl.³ F28B 9/02

U.S. Cl. 165—113 7 Claims



1. In a heat exchanger having tubes combined into at least two horizontally arranged bundles with heating steam flowing into the tubes and a heating working medium flowing around the tubes, the tube bundles being streamed in series by the heating steam and circumflowed in series by the working medium and wherein the individual bundles are connected flow-upstream with a distribution chamber and flow-downstream with a drainable collecting chamber, the individual tube bundles having different heat exchanging surfaces such that the heating steam flow cross section of the tube bundles decreases in the direction of flow of the heating steam, the improvement comprising orifices with different inlet cross sections arranged at the inlet openings of each of the tubes streamed by the heating steam, said orifices being arranged such that within each tube bundle the inlet cross sections become smaller in the direction of flow of the heating working medium.

4,330,035

HEAT EXCHANGER

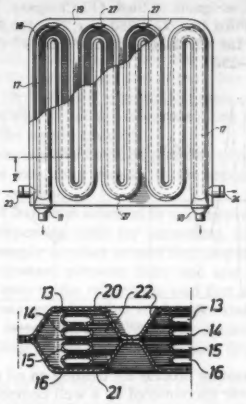
Björn Hillerström, Onsala, Sweden, assignor to AB CTC, Ljungby, Sweden

Filed Sep. 4, 1979, Ser. No. 72,564

Int. Cl.³ F28D 7/02, 7/10

U.S. Cl. 165—164 11 Claims

1. A heat exchanger comprising: a plurality of serpentine tubes which provide respective serpentine parallel flow paths for a first medium and which are arranged so that a gap is provided between each adjacent pair of said tubes; and a casing enclosing said tubes and having an inlet and an outlet for a second medium, said casing being internally shaped to define a serpentine channel containing said tubes, which channel connects said inlet to said outlet to provide a flow path for the second medium, and said heat exchanger further comprising a plurality of constraining means located along the channels for constraining the second medium to flow from one side of the channel to the other side thereof cross-wise of said tubes and thereby, in cooperation with said casing, providing division of the flow of the second medium into a substantially pure counter-flow and a substantially pure cross-flow, the division of the flow of the second medium taking place at locations along the channels between: (i) the inlet and a constraining means posi-



tioned adjacent to the inlet, (ii) two adjacent constraining means; and (iii) the outlet and a constraining means positioned adjacent to the outlet.

4,330,036

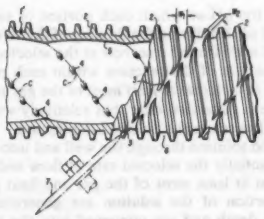
CONSTRUCTION OF A HEAT TRANSFER WALL AND HEAT TRANSFER PIPE AND METHOD OF PRODUCING HEAT TRANSFER PIPE

Yoshiyuki Satoh, Isehara, and Tomio Higo, Hatano, both of Japan, assignors to Kobe Steel, Ltd., Kobe, Japan

Filed Aug. 21, 1980, Ser. No. 180,038

Int. Cl.³ F28F 1/42

U.S. Cl. 165—179 4 Claims

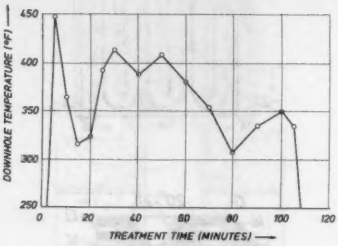


1. A heat transfer wall comprising a heat transfer wall body, a plurality of fins integrally formed on one surface of said body, extending parallel to each other and having breaks formed therein at a predetermined pitch, and a plurality of discrete projecting beads integrally formed on the other surface of said body, wherein said fins, when viewed in a direction perpendicular to a wall surface of the wall body, extend in a direction which crosses imaginary lines connecting said beads, said beads being formed on at least some of the intersections between said fins and said imaginary lines, and wherein said wall body has a wavy surface with said imaginary lines bulging to form raised areas extending in the direction of said imaginary lines, said beads being formed upon said raised areas.

4,330,037
WELL TREATING PROCESS FOR CHEMICALLY HEATING AND MODIFYING A SUBTERRANEAN RESERVOIR

Edwin A. Richardson, Houston, Tex., and Walter B. Fair, Jr., Slidell, La., assignors to Shell Oil Company, Houston, Tex.

Filed Dec. 12, 1980, Ser. No. 215,895
Int. Cl.³ E21B *43/22, 43/24, 47/00*
U.S. Cl. 166—250 **5 Claims**



1. A well treating process for treating an oil and water-containing reservoir encountered by a well comprising:

selecting a treatment temperature to which a selected zone within the reservoir is to be heated;

selecting a volume of liquid which is at least sufficient to substantially fill all of the water-occupied volume within the selected zone;

selecting a fluid flow rate at which such a volume of liquid can be flowed through the well and into the reservoir without requiring an undesirably long time or hydraulically damaging the well or reservoir;

compounding sufficient aqueous liquid solution to provide the selected volume of liquid so that substantially every portion of the solution contains enough dissolved heat and nitrogen gas-generating reactive components to heat that portion to a temperature at least substantially equalling the selected treatment temperature;

using as said reactive components a mixture consisting essentially of (a) at least one each of water-soluble compounds which contain ammonium ions and nitrite ions and react exothermally within an aqueous solution to generate nitrogen gas and (b) at least one buffering material for maintaining a selected pH which controls the rate of that reaction;

arranging the pH at which each portion of said solution is buffered so that during the flowing of the solution through the well and into the reservoir at the selected rate of fluid flow, the rate of the reaction within each portion of the solution is such that at least most of the gas and heat it can generate is generated after, but relatively soon after, that portion has reached a selected depth; and,

flowing said solution through the well and into the reservoir at substantially the selected rate of flow and in a manner such that at least most of the gas and heat generated by each portion of the solution are generated below the selected depth and are conveyed into the selected zone within the reservoir so that it is heated to substantially the selected temperature.

4,330,038
OIL RECLAMATION PROCESS

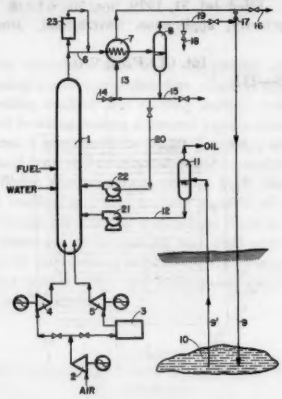
Charles L. Soukup, Schofield, Wis., and Richard K. Kerr, Calgary, Canada, assignors to Zimpro-AEC Ltd., Calgary, Canada

Filed May 14, 1980, Ser. No. 149,721
Int. Cl.³ E21B *43/24, 43/34*
U.S. Cl. 166—267 **40 Claims**

1. A process of enhanced oil recovery by gas injection into oil-bearing formations, which comprises wet oxidizing combustible carbonaceous materials with an approximately stoichiometric quantity of substantially pure oxygen to obtain a gas comprising a mixture of water vapor and carbon dioxide substantially free of oxides of sulfur and nitrogen; injecting said gaseous mixture into an oil-bearing formation to produce a mixture of oil and water; extracting said mixture of oil and water from the oil-bearing formation; substantially separating the water from the latter mixture; and recycling the water, including any residual oil contained therein, to the wet oxidation reactor.

36. An apparatus for enhanced recovery of oil from an oil-bearing formation, comprising:

(a) a reactor for wet oxidation of carbonaceous fuel to generate a water vapor containing gas, said reactor having inlets for supplying fuel, water and air or oxygen;



(b) a well for injecting gas into an oil-bearing formation;

(c) conduit means for delivering generated gas to said injection well;

(d) a well for producing a mixture of oil and water from said formation;

(e) means for separating said mixture into a produced oil stream and a produced water stream;

(f) pumping means for pressurizing the produced water stream; and

(g) conduit means for introducing the produced water stream into the reactor.

4,330,039
PRESSURE ACTUATED VENT ASSEMBLY FOR SLANTED WELLBORES

Roy R. Vann; George W. Ribble, and Flint R. George, all of Houston, Tex., assignors to Geo Vann, Inc., Houston, Tex.

Filed Jul. 7, 1980, Ser. No. 166,547
Int. Cl.³ E21B *34/10, 43/117, 43/12*
U.S. Cl. 166—297 **20 Claims**

14. In a cased borehole having a tubing string attached to a perforating gun device, a packer located along the tubing string and dividing the casing annulus into an upper and lower annular area, and a vent assembly located between the gun and packer, the method of completing the well comprising the steps of:

(1) positioning the gun adjacent to a hydrocarbon containing formation;

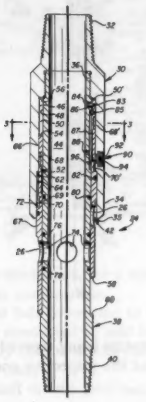
(2) providing said gun with a gun firing head which extends into the lower end of the lower tubing string so that the gun can be detonated by extending a detonation device down through the interior of the tubing string and into contact with the gun firing head;

(3) providing said vent assembly with a ported annular body; forming an annular chamber within said ported annular

body and slidably mounting a ported sleeve within said annular chamber and concentrically respective to the ported annular body;

(4) effecting a pressure differential between the tubing and lower annular area, by elevating the pressure within the tubing string;

(5) using the pressure differential of step (4) to force the sleeve to slide axially of said annular body;



(6) using the sliding movement of step (5) to cause the ports within the annular body to register with the ports in the sleeve;

(7) detonating the gun by extending a detonation device down through the interior of the tubing.

18. The method of claim **14** and further including the steps of releasably holding the sleeve until the pressure differential of step (4) reaches a predetermined value before carrying out step (5).

4,330,040

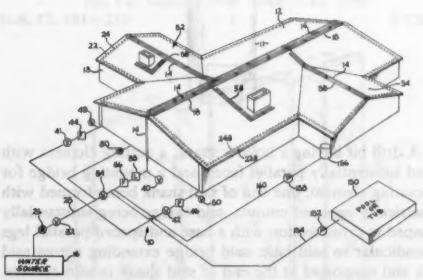
FIRE PREVENTION AND COOLING SYSTEM

Gerald R. Ence, 1227 Woodrow St., Oildale, Calif. 93308, and Robert D. Ence, 255 S. Main St., Aurora, Utah 84620

Continuation-in-part of Ser. No. 74,913, Mar. 12, 1979, abandoned. This application May 12, 1980, Ser. No. 149,014

Int. Cl.[3] **A62C** *35/00*

U.S. Cl. 169—13 **5 Claims**



1. A liquid dispensing system primarily for fire prevention whereby water may be transferred from a source to potentially combustible parts of a structure, such as a roof or side walls, the system comprising:

a supply conduit communicating water from said source to a dispensing tube, said supply conduit including a filter and having a first portion thereof disposed above the peak of a roof of such structure and at least a second portion disposed perpendicular to said first portion and extending away therefrom, said second portion including an arm extending perpendicularly therefrom for partially going around an obstacle;

a first dispensing tube having a plurality of openings, said tube having a generally U-shape where said U-shape has oppositely disposed arms and a connecting base portions, wherein water in any part of one arm of the U can communicate with water in any part of the other arm of the U by way of the base and wherein the arms of said U are disposed parallel to but at a lower elevation from the first portion of the supply conduit;

a second dispensing tube having a plurality of openings, said second tube extending parallel to the second portion of said supply conduit;

a first series of feed lines attached to said supply conduit and said first dispensing tube for permitting water to flow from said supply conduit to said first dispensing tube at relatively constant pressure from one arm of said first dispensing tube to the other arm, said first series of feed lines being staggered so that feed lines extending to one arm of said dispensing tube are out of alignment with feed lines extending to the other arm of said first dispensing tube; and

a second series of feed lines attached to said second portion of said supply conduit and said second dispensing tube for permitting water to flow from said second portion of said supply conduit to said second dispensing tube at relatively constant pressure from one end of said second dispensing tube to the other wherein blockages of certain portions of said first dispensing tube does not deprive downstream sections of said dispensing tube of water.

4,330,041

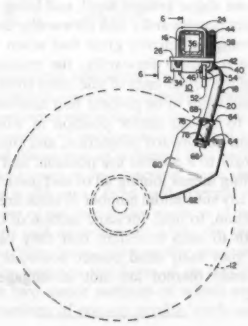
SCRAPER ASSEMBLY

Thomas W. Ankenman, Hutchinson, Kans., assignor to Krause Plow Corporation, Hutchinson, Kans.

Filed Jul. 28, 1980, Ser. No. 173,050

Int. Cl.[3] **A01B** *23/06*

U.S. Cl. 172—566 **5 Claims**



1. A scraper assembly for a tillage disc comprising:

a support;

an L-shaped scraper mount having an elongated arm sloping downwardly at an angle from the support toward the disc to be scraped, and a lateral extension at the upper end of the arm;

a scraper blade mounted on the arm at its lowermost end;

bearing means mounted on the support and rotatably receiving said extension for swinging movement of the arm toward and away from said disc;

spring tension adjusting means having an upstanding portion pivotally coupled at its lower end with said arm;

a compression spring coiled about said tension means and

resting at its lower end on the support for yieldably biasing the blade against the disc; and

a bracket secured to the extension, said portion being pivotally coupled with the bracket,

said tension means including an L-shaped bolt having an upright spring-receiving leg, presenting said portion, and a lateral bracket-receiving leg.

4,330,042

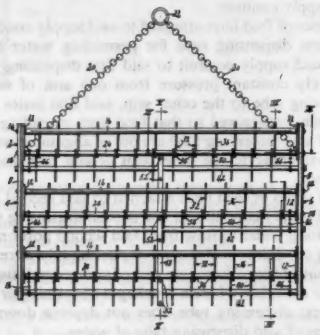
THATCH LOOSENING RAKE

Lawrence L. Duckworth, 7510 Maple La., Raytown, Mo. 64138

Filed Feb. 20, 1981, Ser. No. 236,594

Int. Cl.³ A01B *31/00*

U.S. Cl. 172—621 **7 Claims**



1. A thatch loosening rake comprising:

a. a frame having a substantial horizontal area and adapted to be drawn over the ground,

b. a large number of slender, elongated resilient teeth distributed over the area of said frame,

c. mounting means securing the upper ends of said teeth in said frame, said teeth extendng at all times below the lower plane of said frame to engage the ground to support said frame above ground level, and being biased normally to project downwardly and forwardly, the weight of said frame being sufficiently great that when

said frame is moved forwardly, the resistance to forward travel of the lower ends of said teeth over the ground will cause said teeth to be pivoted first downwardly and rearwardly to a dead center position in which they have a maximum downward projection, and then upwardly and rearwardly to a normal use position, and

d. connecting means joining all of said teeth and operable, so long as any substantial number of teeth are disposed in said use position, to limit forward motion of the remainder of the teeth to such an extent that they cannot move forwardly past their dead center positions even when the lower ends thereof are not in engagement with the ground.

4,330,043

KEYSEAT WIPER

Marion C. Sheffield, and Paul H. Dalier, both of Laurel, Miss., assignors to Drill Services, Inc., Laurel, Miss.

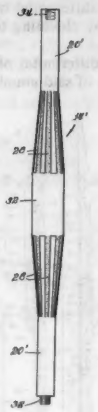
Filed Oct. 22, 1980, Ser. No. 199,556

Int. Cl.³ E21B *7/28, 7/04*

U.S. Cl. 175—406 **7 Claims**

1. In a keyseat wiper having a generally cylindrical body, means for connecting the body at its opposite ends in a string of drill pipe, and a plurality of cutting elements spaced apart on the body, the improvement wherein said body comprises:

(a) a cylindrical middle guard portion of greater cross-sectional diameter than the maximum outside diameter of said cutting elements, said guard portion being free of cutting elements, and



(b) said cutting elements being tapered between said middle guard portion and the respective ends of said body.

4,330,044

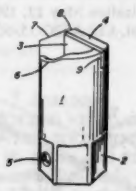
DRILL BIT

Thomas M. Orr, Greensburg, and Paul V. Baker, Indiana, both of Pa., assignors to ORR . . . Screw Machine Products, Inc., d.b.a. ORRCO, Greensburg, Pa.

Filed Jan. 2, 1981, Ser. No. 222,062

Int. Cl.³ E21B *10/52*

U.S. Cl. 175—410 **15 Claims**

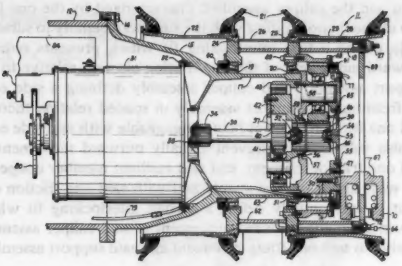


1. A drill bit having a hollow shank, a cutting element with spaced substantially parallel faces, and a mounting bridge for said cutting element, one end of said shank being formed with diametrically opposed cutouts, said bridge being substantially U-shaped in cross section with a base and spaced parallel legs perpendicular to said base, said bridge extending across said shank and supported at the end of said shank in said cutouts, said cutting element supported in said bridge with the longitudinal axis of said cutting element parallel to the longitudinal axis of said bridge, the inner surfaces of said spaced parallel legs of said bridge embracing at least a portion of each face of said cutting element and the full length of the bottom edge of said cutting element resting on said base, whereby said cutting element is supported in said bridge to resist shear forces and compression forces.

4,330,045
VEHICLE WHEEL MECHANISM

Walter I. Myers, 7629 E. 21 St., Apt. 205, Tulsa, Okla. 74112, assignor to Reliance Electric Company, Cleveland, Ohio

Filed Sep. 14, 1979, Ser. No. 75,798
Int. Cl.³ B60K *1/00*
U.S. Cl. 180—65 F 15 Claims

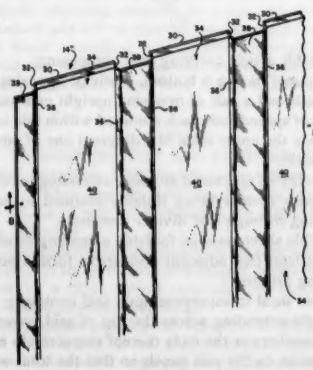


1. A vehicle wheel mechanism for a vehicle having a wheel support, comprising in combination,
a nonrotating wheel hub connected to the wheel support,
a hollow gear case connected to said hub,
a nonrotating, axially outboard wall defining with said hub a part of said gear case,
a rotatable drive shaft in said gear case,
a wheel,
bearing means journaling said wheel on said hub,
a planetary gear set mounted in said gear case and having an input and an output,
drive means operably connecting said input to said drive shaft,
means connecting said output to said wheel for drive thereof,
a rotatable first brake part secured to said wheel outboard of said gear case outboard wall, and
a nonrotatable second brake part secured to said gear case outboard wall at a location remote from the axis of the wheel and acting on said first brake part.

4,330,046
SOUND BARRIER

Armand Lerner, 100 E. Hartsdale, Hartsdale, N.Y. 10530, and Sylvain S. Lerner, 301 E. 79th St., New York, N.Y. 10020

Continuation-in-part of Ser. No. 79,784, Sep. 28, 1979, Pat. No. 4,278,146. This application Jun. 26, 1981, Ser. No. 277,676
Int. Cl.³ G10K *11/04*; E04B *1/84, 1/99*
U.S. Cl. 181—210 5 Claims

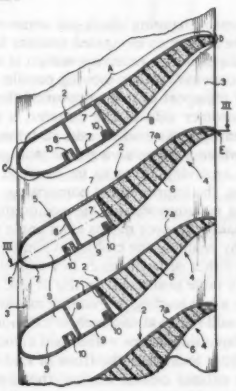


1. A sound barrier for isolating a noise source comprising,
(a) a transparent panel made of sound attenuating material,
(b) said panel comprising a plurality of longitudinally extending side by side co-planar flat sections having opposite perpendicularly extending sidewalls, and separated by intermediate sections so as to define a plurality of longitudinally extending side by side cavities, said flat sections comprising the major part of said panel,
(c) at least some of said cavities being provided with acoustical absorptive material therein in engagement with the entire transverse extent of the flat sections thereof,
(d) said barrier being disposed so that the open faces of said cavities confront said noise source, and with the plane defined by said co-planar flat sections extending vertically.

4,330,047
SOUND-ATTENUATING VENTILATION

Giacomo Ruspa, and Luigi Franco, both of Turin, Italy, assignors to Centro Ricerche Fiat S.p.A., Turin, Italy

Filed Aug. 29, 1980, Ser. No. 182,532
Claims priority, application Italy, Oct. 5, 1979, 68932 A/79
Int. Cl.³ E04F *17/04*
U.S. Cl. 181—224 12 Claims



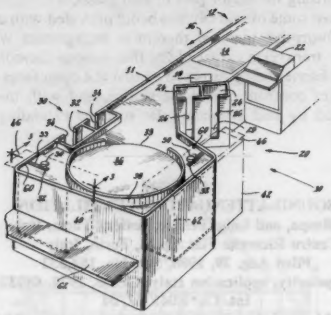
1. A sound-attenuating ventilation louver for location in an opening of a wall which separates a chamber containing a noise source from the external environment, said louver comprising a frame and a plurality of horizontally disposed profiled slats supported by said frame and so arranged that in the operative orientation of the louver in said opening, each slat slopes upwardly across its width away from said external environment whereby a first one of the two major surfaces of said slat faces upwardly towards said environment while the second one of said two major surfaces faces downwardly towards said chamber, each said slat being in the form of an aerodynamically-shaped blade the two major surfaces of which are connected by curved end sections of convex profile, each said slat comprising:
a solid portion formed from sound-absorbent material and extending from an intermediate zone of the slat to the longitudinal edge thereof which in the operative orientation of the louver is nearest the said chamber containing the noise source, and
a wall of rigid material defining a hollow portion extending from said intermediate zone to the longitudinal edge of said slat which in the operative orientation of the louver is nearest the said external environment, said hollow portion being sub-divided into a plurality of chambers each of which acts as a resonator and is in communication with the atmosphere through at least one hole defined in said wall.

4,330,048

COOPERATIVE BAGGING CHECK-OUT COUNTER

Stanley S. Joseloff, 217 Webb Rd., Fairfield, Conn. 06432

Filed Mar. 19, 1979, Ser. No. 21,558
Int. Cl.[3] B65B 67/12
U.S. Cl. 186—66 7 Claims



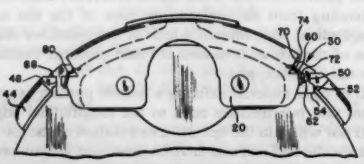
1. In a cooperative bagging check-out counter for supermarkets and the like having an elongated counter having a principal longitudinal axis with a receiving station at one end thereof equipped with conveyor means moving parallel to said axis for the receipt and transport of items deposited thereon by a customer on a customer side of the counter, a storage station positioned at an opposite end of said counter, and a cashier station intermediate said receiving end storage stations, said cashier station receiving items to be checked out from said conveyor means, the improvement comprising: a recess in said cashier's station accommodating the positioning of a cashier therein facing said conveyor means at an angle with respect to said axis, thereby enabling the cashier to handle items from the conveyor with either or both hands in a sweeping, swimming motion; a rotary table positioned on top of said counter at said storage section; a bag loading positioning means located in said counter within said recess at said cashier's station; a first handle operated bag dispensing means within said counter for dispensing bags therefrom located in the front of said storage station facing the rear of said cashier station, thereby being readily accessible to a cashier; and a second handle operated bag dispensing means for dispensing bags therefrom disposed within said counter at the rear of said storage station facing said customer side of the counter, thereby enabling the customer to perform a bagging operation.

4,330,049

DISC BRAKE ASSEMBLY AND RESILIENT MEMBER THEREFOR

Mark J. Cybulski; Bert A. Gumkowski, both of South Bend, and Larry A. Portolese, Granger, all of Ind., assignors to The Bendix Corporation, Southfield, Mich.

Filed Jan. 28, 1980, Ser. No. 116,126
Int. Cl.[3] F16D 65/09, 65/40
U.S. Cl. 188—73.36 17 Claims



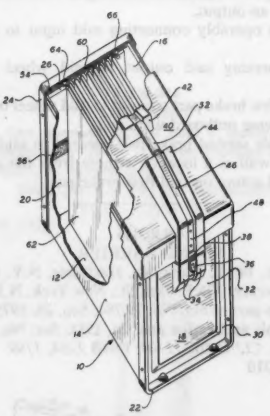
1. In a disc brake assembly having a pair of friction elements which are engageable with a rotatable member during a brake application, a caliper assembly cooperating with the pair of friction elements to urge the latter into engagement with the rotatable member during the brake application, a support assembly movably disposing the caliper assembly relative to the rotatable member, and a resilient member engageable with the caliper assembly and at least one of the pair of friction elements to yieldably oppose separation between the one friction element and the caliper assembly, characterized by the one friction element cooperating with the support assembly to substantially define a first interlocking fit which prevents radially outward movement of the one friction element relative to the support assembly, said caliper assembly defining a side edge confronting said support assembly in spaced relation thereto, said one friction element being engageable with said side edge to also substantially prevent radially outward movement of said one friction element, and said resilient member cooperating with said caliper assembly and with said one friction element to substantially define a second interlocking fit which prevents radially outward movement of said caliper assembly relative to said one friction element and said support assembly.

4,330,050

PORTABLE ARTICLE CARRYING CASE

Marshall A. Sangster, 35 Glenside Trail, Sparta, N.J. 07871, and Barrett E. Sangster, Lake Dr., R.D. #2, Stanhope, N.J. 07874

Filed May 23, 1980, Ser. No. 152,674
Int. Cl.[3] A45C 3/00
U.S. Cl. 190—51 13 Claims



1. A portable article carrying case comprising:

(a) a container having a bottom, a pair of opposing upright side walls and a pair of opposing upright end panels;

(b) a pair of spaced rods each mounted within said container alongside the upper edge of a different one of said pair of end panels;

(c) a plurality of apertured dividers, extending between said rods, each divider being slidably retained by said rods extending through said divider apertures;

(d) a flexible sheet material foldably extending downwardly from at least two adjacent dividers to form a pocket for retaining articles;

(e) a cover sized to superpose upon said container; and

(f) a handle extending across the top of said cover having latch members at the ends thereof respectively engaging projections on the end panels so that the total weight of the case and its contents is transferred directly to said handle from said end panels.

4,330,051
DRIVE CONTROLLING MECHANISM

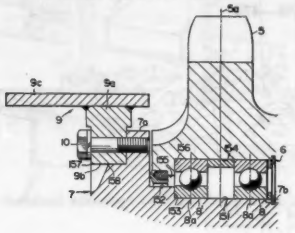
Kiyozumi Fukui, Gifu, Japan, assignor to Teijin Seiki Company Limited, Osaka, Japan

Continuation of Ser. No. 903,043, May 5, 1978, Pat. No. 4,201,279, which is a division of Ser. No. 750,537, Dec. 14, 1976, Pat. No. 4,114,737. This application Feb. 15, 1980, Ser. No. 122,265

Claims priority, application Japan, Dec. 18, 1975, 50-171224

Int. Cl.[3] F60K *41/20;* F01B *13/04*

U.S. Cl. 192—3 N 2 Claims



1. A crawler type vehicle driving apparatus comprising an axial plunger type hydraulic motor having a plurality of cylinder bores, an output rotary portion and a parking brake for braking said output rotary portion, a motor housing accommodating therein said hydraulic motor, a fixed frame fixedly retaining said motor housing, a driven member rotatably engaged by said hydraulic motor through said output rotary portion, a control block securely mounted on said motor housing and having therein a pair of inlet-outlet passages in communication with said cylinder bores, a control valve securely mounted on said control block and having therein a valve spool for controlling rotation of said hydraulic motor, the improvement comprising: said motor housing having an annular flange portion formed on the outer periphery thereof and a plurality of threaded bores extending axially for receiving a bolt for securely connecting said fixed frame and said motor housing, said fixed frame having an axial frame bore and said motor housing having a peripheral face in engagement with said axial frame bore of said fixed frame, said motor housing having an additional peripheral face extending oppositely to said fixed frame and rotatably engaged with said driven member, said oppositely extending peripheral face having a smaller diameter than that of said peripheral face in engagement with said axial frame bore, said control block having on its outer periphery a flat outer peripheral face which extends in a plane substantially perpendicular to the rotational axis of said driven member and to which is attached said control valve with said valve spool extending substantially perpendicular to the rotational axis of said driven member, the maximum length of said control block extending substantially perpendicular to said rotational axis of said driven member being smaller than the diameter of said axial frame bore of said fixed frame.

4,330,052
COMBINED STOP AND LIMIT SWITCH

Michael J. Schymick, 5299 Hertford, Troy, Mich. 48084

Filed Aug. 29, 1980, Ser. No. 182,539

Int. Cl.[3] F16D *71/04;* H01H *3/16;* B27G *23/00*

U.S. Cl. 192—148 10 Claims

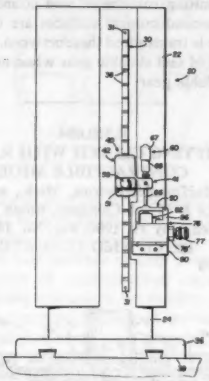
1. A limit switch gauging apparatus for a member reciprocal along a path of travel relative to a support wherein the member is driven by a drive source controlled by electrical circuit means; said apparatus comprising:

a lineal distance gauging rod mounted on the member with the rod longitudinal axis parallel with the member path of travel, said rod having a plurality of indents incrementally spaced along its axis;

a body slidably carried on said rod for movement along the rod axis including locking means by which said body is releasably coupled with a selected one of said indents;

a micrometer on said body having a micrometer spindle adapted to be moved to a selected graduated setting on an axis parallel with said rod axis;

a switch on said support including actuator means resiliently urged toward said spindle to an extended switch closed position opposite from a retracted switch open position;



the arrangement characterized in that with said body locking means coupled to a selected one of said rod indents and said micrometer spindle set at a preselected graduation, the closing of the circuit means causing the member to be driven along its path of travel resulting in the end face of said spindle engaging said switch actuator means whereby said switch actuator means is moved to its switch open position opening the control circuit de-energizing the drive source.

4,330,053
MESHING DEVICE FOR AN AFTER-RUNNING TRANSMISSION SHAFT

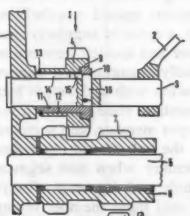
Reinhard Gesenhaus, Bergisch Gladbach, Fed. Rep. of Germany, assignor to Ford Motor Company, Dearborn, Mich.

Filed Apr. 28, 1980, Ser. No. 144,488

Claims priority, application Fed. Rep. of Germany, Apr. 25, 1979, 2916626

Int. Cl.[3] F16D *67/02;* B60K *41/26;* F16H *57/10*

U.S. Cl. 192—4 C 5 Claims



1. A braking device for a transmission shaft comprising:

a slidable gear supported on a fixed axle for rotation and axial movement having a first conical surface formed thereon;

a first gearwheel mounted for rotation having gear teeth disposed for engagement by the teeth of said slidable gear

when said slidable gear is moved axially toward said first gearwheel;

a second gearwheel mounted for rotation having gear teeth disposed for engagement by the teeth of said slidable gear when said slidable gear is moved axially and after it has engaged the teeth of said first gearwheel;

a countercone mounted for rotation and axial movement on the fixed axle having a second conical surface adapted to engage the first conical surface; and

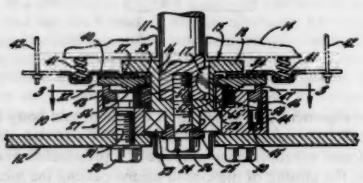
means for limiting rotation of said countercone when said first and second conical surfaces are driveably engaged and torque is transmitted therebetween, but allowing axial movement of said slidable gear when no torque is applied to said slidable gear.

4,330,054

AMPLIFYING CLUTCH WITH RADIALLY CONTRACTIBLE SHOE

J. G. Fraser MacDonald, Detroit, Mich., assignor to Warner Electric Brake & Clutch Company, South Beloit, Ill.

Filed May 19, 1980, Ser. No. 151,340
Int. Cl.³ F16D *13/08, 67/02*
U.S. Cl. 192—35 **4 Claims**



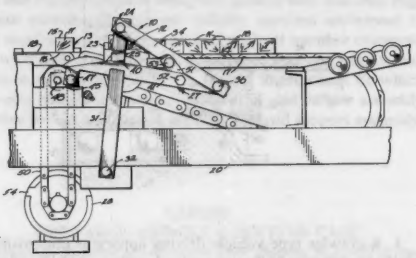
1. A clutch comprising rotatably mounted input and output members, said input member having a hub and having a flange projecting radially from said hub, a rotatably mounted first shoe supported to move axially relative to said input and output members and to turn angularly through a limited distance relative to said output member, coacting friction surfaces on said flange and said first shoe, said friction surfaces engaging one another and causing said first shoe to turn with said input member and through said limited distance relative to said output member when said first shoe is moved axially toward the flange of said input member, said friction surfaces effectively releasing one another and enabling said input member to turn relative to said first shoe when said first shoe is moved axially away from the flange of said input member, and selectively operable means for causing said first shoe to move axially toward and away from the flange of said input member, said clutch being characterized by a second shoe comprising a series of segments spaced angularly around the hub of said input member, a series of angularly spaced lugs rigid with said output member and located between said segments, said lugs circumferentially engaging said segments to couple said segments for rotation with said output member and also supporting said segments to slide radially toward and away from the hub of said input member, said segments radially and frictionally gripping the hub of said input member and turning with said input member when said segments are moved radially toward said hub, said segments effectively releasing said hub and enabling said input member to turn relative to said segments when said segments are moved radially away from said hub, and a helical spring telescoped over said segments and having ends connected to said first shoe and to said output member, said spring wrapping down on said segments and causing said segments to radially and frictionally grip the hub of said input member in response to said first shoe turning through said limited distance, said segments being free of radial frictional engagement with said output member at all times so that the only transmission of torque between said segments and said output member is effected by virtue of the circumferential engagement of said segments with said lugs.

4,330,055

BOARD FEEDER FOR LUMBER HANDLING SYSTEMS

Sidney L. Lunden, E. 12205 Empire Way, Spokane, Wash. 99206

Filed Apr. 11, 1980, Ser. No. 139,417
Int. Cl.³ B65G *37/00, 25/00*
U.S. Cl. 198—474 **6 Claims**



1. A board feeder assembly for lumber handling systems for successively feeding elongated boards having opposed top and bottom side surfaces from a feed station over a stop to a delivery station; comprising:

a framework;

a first clamp means on the framework for gripping the top surface of a board at the feed station and for releasing the board at the delivery station;

second clamp means on the framework for gripping the bottom surface of a board at the feed station and for releasing the board at the delivery station;

linkage means interconnecting the first and second clamp means for reciprocating the first and second clamp means in unison between the feed station and delivery station;

drive means connecting the frame and linkage means for selectively operating the linkage means to reciprocate the first and second clamp means between the feed and delivery stations; and

wherein the second means is moved through a closed curve with an upper portion of the curve situated above the feed station and delivery station and a lower portion of the curve situated below the feed station and delivery station.

4,330,056

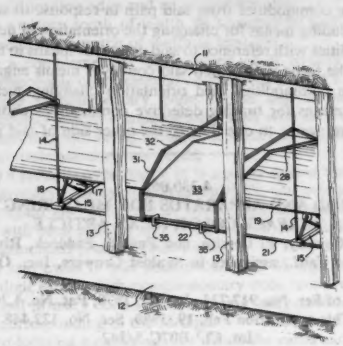
MINE CONVEYOR BELT MAN CROSSOVER

Salvatore R. Marino, Marino Construction Co., General Contractors, 818 Allegheny River Blvd., Oakmont, Pa. 15139

Filed Jan. 29, 1980, Ser. No. 116,635
Int. Cl.³ B65G *21/00*
U.S. Cl. 198—860 **3 Claims**

1. A movable man crossover for underground belt conveyors having supporting cables extending longitudinally along each side thereof, comprising a pair of longitudinal members each contoured in cross section to rest on one of said cables and partially enclose the cables, a pair of flat U-shaped deformable members fitting around the longitudinal member and cable face-to-face, with the extending legs of each U-shaped member bent around the bottom portion of the other U-shaped member for fastening the longitudinal members to the supporting ca-

bles, a crossover deck connected at each end to one of said longitudinal members and supported thereby but spaced there-



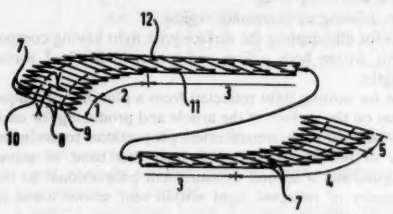
from and a handrail attached to each side of the crossover deck.

4,330,057

PLATFORM CONVEYORS

Keith Binns, Harmandsworth, England, assignor to Dunlop Limited, London, England

Continuation of Ser. No. 667,284, Mar. 16, 1976, abandoned. This application Jul. 8, 1977, Ser. No. 813,986
Claims priority, application United Kingdom, Mar. 22, 1975, 12065/75
Int. Cl.³ B65G *23/00*
U.S. Cl. 198—334 10 Claims



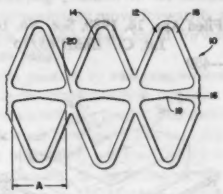
1. A platform for a platform conveyor having guide rail means for the platforms, the guide rail means being spaced apart transversely of the conveyor travel direction, said platform comprising a torsionally rigid substantially flat elongated plate having an upper conveying surface and a lower surface having means to engage said rail means, said engaging means comprising two wheel sets, each positioned to engage a rail means, each said wheel set having means to attach it to said lower surface, said attachment means restraining the wheel set against rotation about an axis lying parallel to the plane of the plate but permitting rotation about an axis perpendicular to the plane of the plate; each wheel set comprising a rigid frame having a single upper and a single lower wheel means for running on upper and lower surfaces of the rail means, the rotational axes of the upper and lower wheel means of each wheel set being spaced apart in the direction of normal movement of the platform with the upper wheel means of one wheel set being leading in the direction of movement and the upper wheel means of the other wheel set being trailing in the direction of movement, the torsional rigidity of the plate co-operating with the rigidity of the attachment means to restrain the plate against tilting movement.

4,330,058

CONTAINER CARRIER PREFORM STRIP

Mindaugas J. Klygis, Barrington, Ill., assignor to Illinois Tool Works Inc., Chicago, Ill.

Filed Jun. 13, 1980, Ser. No. 159,028
Int. Cl.³ B65D *71/00, 75/00, 85/62*
U.S. Cl. 206—150 5 Claims



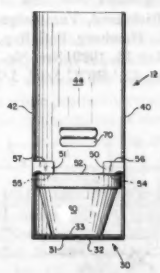
1. A container carrier preform strip of substantially uniform thickness adapted to be stretchingly, permanently deformed to create a package making device for a plurality of substantially identical containers, said package making device defined by a plurality of apertures of predetermined circumference for receiving and retaining containers, the preform strip including a plurality of bands creating a plurality of apertures arranged in an array of a plurality of rows and a plurality of ranks, each aperture in the array having substantially smaller circumferences than said predetermined circumference in the resulting package making device, the apertures in the preform being elongated in directions perpendicular to the length axis of the strip, each band in said preform including first regions extending in the direction of said length axis and designed to be highly stretched and oriented and second regions associated with said first regions defining the remaining portions of the bands, the first band regions including a narrowed section intermediate its extremities serving to locate the point of limitation of elongation and orientation of said first regions upon the application of forces in the length direction of said regions.

4,330,059

PLANT SHIPPING AND DISPLAY CONTAINER

Leslie C. Freeman, 22721 Locust Way, Bothell, Wash. 98011

Filed Jul. 24, 1980, Ser. No. 171,734
Int. Cl.³ B65D *85/52, 81/02, 65/24*
U.S. Cl. 206—423 9 Claims



1. A corrugated paper shipping and display carton for potted plants, comprising:

a horizontal base upon which rests a pot;

a sheath having front, back and sidewall panels extending vertically from the base, the spacing between the front and back walls being approximately equal to a transverse dimension of said pot so that said pot contacts the front and rear walls of said sheath; and

a pair of inwardly projecting tabs projecting from said front wall and said back wall above opposite side of the pot,

with the lower edges of said tabs engaging the upper edge of the pot to hold the pot in position on the base.

4,330,060

CAKE PLATE WITH MESSAGE CONCEALING COMPARTMENT

Craig E. Thornton, 19662 Sacramento, Huntington Beach, Calif. 92647

Filed Apr. 14, 1980, Ser. No. 140,132
Int. Cl.³ B65D *65/16*
U.S. Cl. 206—459 **11 Claims**

1. A food serving plate for mounting cakes, dessert items, and the like, comprising:

a planar plate for receiving and mounting said cakes, dessert items, and the like, said plate having a hidden compartment with an opening at one side of said plate;

a normally concealed card, movable in said compartment, said card having a message portion for the display of a visual message, said message portion being selectively (i) exposed by partial removal of said card from said compartment through said opening or (ii) concealed by insertion of said card into said compartment through said opening; and

means for preventing the complete removal of said card from said compartment, comprising:

a slotted opening in said card; and

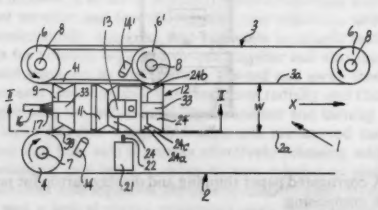
a peg fixed in said compartment and inserted through said slotted opening in said card such that the rear edge of said slotted opening abuts against said peg to prevent complete removal of said card from said compartment.

4,330,061

METHOD AND APPARATUS FOR DETECTING AND SEGREGATING DEFECTIVE COMMODITIES FROM A SERIES OF DISCRETE COMMODITIES

Willy Rudszinat, Dassendorf, Fed. Rep. of Germany, and Siegfried Abrahams, Richmond, Va., assignors to Hauni-Werke Körber & Co. KG., Hamburg, Fed. Rep. of Germany

Filed May 15, 1980, Ser. No. 146,486
Int. Cl.³ B07C *5/02, 5/36*
U.S. Cl. 209—3.1 **49 Claims**



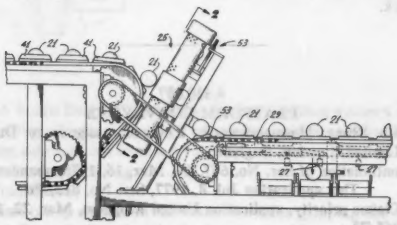
1. Apparatus for ascertaining the condition of and segregating defective commodities from a series of discrete spaced apart commodities, comprising means for transporting the commodities of said series along a predetermined path including conveyor means engaging the commodities at the opposite sides of said path and means for driving said conveyor means so as to advance the commodities in a predetermined direction; means for monitoring the condition of successive commodities of said series, including means for generating signals denoting the defective commodities; and means for effecting removal of defective commodities from said path in response to said signals, including means for changing the orientation of defective commodities with reference to said conveyor means to thereby reduce the force with which said conveyor means engage the defective commodities, said orientation changing means including means for turning defective commodities about axes which are nearer to one than to the other side of said path.

4,330,062

METHOD AND APPARATUS FOR MEASURING THE SURFACE COLOR OF AN ARTICLE

Tim D. Conway, El Cerrito, and Paul F. Paddock, Riverside, both of Calif., assignors to Sunkist Growers, Inc., Ontario, Calif.

Division of Ser. No. 917,724, Jun. 21, 1978, Pat. No. 4,246,098. This application Feb. 19, 1980, Ser. No. 122,448
Int. Cl.³ B07C *5/342*
U.S. Cl. 209—582 **21 Claims**



1. Apparatus for measuring the surface color of an article, said apparatus comprising:

means defining an examining region;

means for illuminating the surface with light having components within both a first and a second band of wavelengths;

means for sensing light reflected from a plurality of unique areas on the surface of the article and producing for each of said areas a first measurement proportional to the intensity of reflected light within said first band of wavelengths, and a second measurement proportional to the intensity of reflected light within said second band of wavelengths;

first means for comparing each of said first measurements with the corresponding one of said second measurements, thereby producing a plurality of characteristic color signals for the article;

second means for comparing each of said characteristic color signals to a predetermined threshold and producing color count pulses in accordance with the results of the comparisons; and

means for counting the number of color count pulses, thereby producing a measure of the amount of surface having a prescribed color.

4,330,063

MACHINE-RETRIEVABLE CARD AND CARD RETRIEVAL APPARATUS AND METHOD THEREFOR

Paul Neumeier, Loveland, Ohio, assignor to O.K. Partnership, Cincinnati, Ohio

Filed Feb. 29, 1980, Ser. No. 125,975
Int. Cl.³ B07C *3/20*
U.S. Cl. 209—608 **30 Claims**

1. A card selection system comprising:

a plurality of cards supported in face-to-face relation in a

deck, each card having leading and trailing edges between which is located a sorting edge along which are provided:

(a) an acquisition tooth of specified width W bounded by said leading edge and an acquisition slot,

(b) a return tooth of width W bounded by said trailing edge and a notch of width at least 2W,

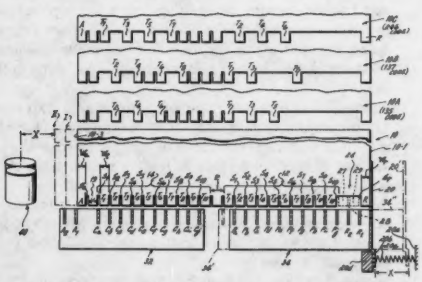
(c) a complementary code region of N equally spaced removable complementary code teeth each of width W, said complementary code region also including N equally spaced complementary slots with each complementary slot being located forwardly of its associated complementary code tooth,

(d) a primary code region of N equally spaced removable primary code teeth each of width W, said primary code region also including N equally spaced primary slots with each primary slot being located rearwardly of its associated primary code tooth,

(e) said cards in said deck encoded in M digit out of N digit format with complementary code teeth removed, and primary code teeth remaining, only at M locations corresponding to the M digits,

a card-locating member against which the cards can abut to locate said cards in a home position,

a first acquisition blade disposed opposite said leading edge of said cards in said home position, said first acquisition blade being movable between engaged and disengaged positions relative to said acquisition slot of a card in a partially selected position displaced forwardly of said



home position a distance W, said first acquisition blade positively preventing rearward movement of a card in said partially selected position when engaged with the acquisition slot thereof,

a second acquisition blade disposed parallel to said first acquisition blade and forwardly thereof a distance W, said second acquisition blade being movable between engaged and disengaged positions relative to said acquisition slot of a card in a fully selected position displaced forwardly of said home position a distance 2W, said second acquisition blade positively preventing rearward movement of a card in said fully selected position when engaged with the acquisition slot thereof,

N equally spaced complementary blades, each corresponding to a different code digit, disposed parallel to said acquisition blades, said N complementary blades being disposed opposite said N complementary slots of a card in said home position, said N complementary blades being movable, one at a time, between engaged and disengaged positions relative to complementary slots aligned therewith, each of said complementary blades, when in its engaged position, positively preventing forward motion of an undesired card having an unremoved complementary code tooth rearwardly of said engaged complementary blade,

N equally spaced primary blades, each corresponding to a different code digit disposed parallel to said acquisition blades, said N primary blades being disposed opposite said N primary slots of a card in said home position, said N primary blades being movable, one at a time, between engaged and disengaged positions relative to primary slots aligned therewith, said primary blades being movable forwardly from a nonselecting position to a selecting position displaced forwardly of said nonselecting position a distance W, each of said primary blades when in its engaged position and moving forwardly a distance W from its nonselecting position to its selecting position being effective to positively move forwardly a distance W a card having a primary code tooth forwardly of said engaged primary blade,

a first return blade parallel to said acquisition blades and located, when in its return position, opposite the forward edge of the return tooth of a card in said partially selected position, said first return blade being movable rearwardly from its return position to a normal position displaced a distance W rearwardly of its return position, said first return blade being movable between engaged and disengaged positions relative to said notch of a card in said partially selected position, said first return blade, when simultaneously in its return and engaged positions and moving rearwardly, positively returning a card having its return tooth rearwardly of said first return blade from said partially selected position to said home position,

a second return blade parallel to said acquisition blades and located, when in its return position, opposite the forward edge of the return tooth of a card in said fully selected position, said second return blade being movable rearwardly from its return position to a normal position displaced a distance W rearwardly of its return position, said second return blade being movable between engaged and disengaged positions relative to said notch of a card in said fully selected position, said second return blade, when simultaneously in its return and engaged positions and moving rearwardly, positively returning a card having its return tooth rearwardly of said second return blade from said fully selected position to said partially selected position,

first selectively operable blade actuating means for selectively moving said primary, complementary, return, and acquisition blades between their engaged and disengaged positions,

second selectively operable blade actuating means for selectively moving said primary and return blades between their nonselecting and selecting positions and their return and normal positions, respectively, and

sequence control means for energizing said first and second blade actuators on a selective and sequential basis to positively select and displace, in M sequential digit selection steps corresponding to the sequence of M digits, a desired card forwardly a distance 2W relative to the remaining undesired cards while positively retaining undesired cards against a relative displacement of distance 2W.

4,330,064

BROKEN PACKAGE CULLING SYSTEM

Lawrence E. Weinert, Antioch, Calif., assignor to Crown Zellerbach Corporation, San Francisco, Calif.

Filed Oct. 2, 1980, Ser. No. 193,051

Int. Cl.³ B07C *5/36*

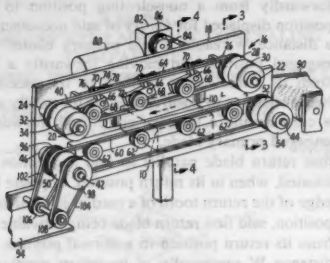
U.S. Cl. 209—617 **8 Claims**

1. Apparatus for culling broken packages comprising:

support means for supporting the bottoms of said packages at a predetermined offset location with respect to said package bottoms whereby said packages will tend to tip and be displaced from said support means under the influence of gravity;

restraining means for engaging said packages to prevent said packages from tipping and being displaced from said support means when said packages are unbroken and

allow said packages to tip and be displaced from said support means when the packages are broken; and



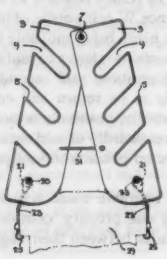
means for moving said support means to transport said packages along a predetermined path of movement.

4,330,065

PORTABLE WATER SKI RACK

William G. Haddad, #47 Hitching Post, Rolling Hills Estates, Calif. 90274

Filed Jul. 21, 1980, Ser. No. 170,853
Int. Cl.³ A47F *7/00*
U.S. Cl. 211—60 SK **6 Claims**



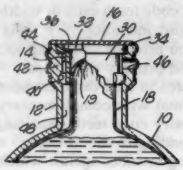
1. A portable rack comprising:
four slotted end pieces,
three long members,
means pivotally attaching two said slotted end pieces to each end of one said long member, near the upper inboard corner of each said slotted end piece,
means fixedly attaching each other said long member, parallel to said one long member, between ends of two corresponding said slotted end pieces,
at least two retainer straps,
means fixedly attaching one end of each said retainer strap to said one long member,
hook means fixedly attached to the end of each said retainer strap distal said one long member,
at least two flexible tie-down members,
means fixedly attaching one end of each tie-down member to one of said other long members such that at least one said tie-down member is attached to each said long member,
hook means fixedly attached to the end of each said tie-down member distal said other long member,
resilient buffering means fixedly attached to all edges of each said slotted end piece, and
two flexible or hinged members, fastened, one between the two said slotted end pieces at one end of said rack, and the other between the two said slotted end pieces at the other end of said rack, near the lower portion of said slotted end pieces, in a manner to limit the relative pivotal movement of said slotted end pieces.

4,330,066

RECEPTACLE WITH COLLAPSIBLE INTERNAL CONTAINER

Robert Berliner, 3843 Dixie Canyon St., Sherman Oaks, Calif. 91423

Filed Nov. 21, 1980, Ser. No. 208,976
Int. Cl.³ B65D *25/16*
U.S. Cl. 215—1 C **26 Claims**



4. A receptacle, comprising:
an outer container of substantially fixed shape formed with a mouth defining an opening into said outer container;
an inner container for holding a fluid, disposed within said outer container and formed with a mouth of substantially fixed shape defining an opening into said inner container, at least a portion of the mouth of said inner container being disposed within the mouth of said outer container, at least a major portion of said inner container being collapsible;
the mouth of said outer container comprising a wall extending outwardly of said container, the outer surface of the mouth of said inner container being spaced from the inner surface of said wall from at least a region adjacent the collapsible portion of said inner container;
at least one aperture through said wall for admitting air between said inner and outer containers whereby to permit collapse of said inner container when fluid is poured therefrom;
a cap fitted to close the mouth of said outer container and to overlie and close said aperture and the mouth of said inner container.

4,330,067

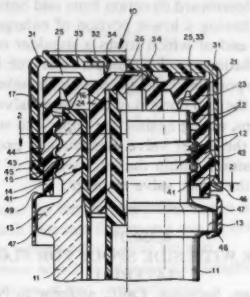
CONTAINER CLOSURE WITH CHILDPROOF LOCK AND ORIGINAL PACKAGE SEAL

Werner Deussen, Eltville, Fed. Rep. of Germany, assignor to Stella KG Werner Deussen, Eltville, Fed. Rep. of Germany

Filed Nov. 13, 1980, Ser. No. 206,623
Claims priority, application United Kingdom, Nov. 19, 1979, 7939906
Int. Cl.³ B65D *55/02*
U.S. Cl. 215—220 **15 Claims**

1. In a container closure comprising a rotary closure cap means adapted to cooperate with holding means and circumferential collar means, both of them being provided at the container adjacent to its opening to be closed, the said rotary closure cap means consisting of an outer cap and an inner cap, in which the said inner cap carrying the elements cooperating with the said holding means of the container for closing the cap, for example carrying an internal thread, further said inner cap being mounted for a turning movement within the said outer cap and to be pushed into the outer cap to a limited extent against the force of a spring means and is secured against its removal from the said outer cap, the said outer cap and the said inner cap having turning coupling means which are designed such that they will only transmit torque from the outer cap to the inner cap when the inner cap has been pushed axially into the outer cap the improvement, wherein

(a) the said inner cap has a supporting band extending round the circumference at its open end, which supporting band projects axially outwardly from the open edge of the said outer cap by an amount greater than the maximum possible depth to which the inner cap can be pushed into the outer cap, and



(b) an original package securing means fitted over the said circumferential collar means of the container is attached to the free circumferential edge of the supporting band by a tear-off connection.

4,330,068

THREE-PIECE STRUCTURE MAGNETIC TAPE CASSETTE

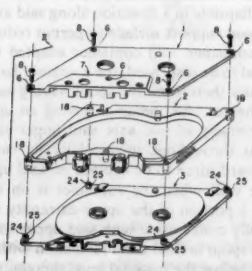
Shigemasa Shoji, Tokyo, Japan, assignor to TDK Electronics Co., Ltd., Tokyo, Japan

Filed Jun. 25, 1980, Ser. No. 162,836

Claims priority, application Japan, Jul. 16, 1979, 54/96780[U]

Int. Cl.³ B65D *6/12*

U.S. Cl. 220—4 B **5 Claims**



1. In a three-piece structure magnetic tape cassette comprising an upper plate, an intermediate frame having a clearance hole and a lower plate, an improvement characterized in that a seat portion is formed at the intermediate part in said clearance hole of the intermediate frame; an annular boss having a counter-sunk hole and having a length sufficient to fit in the upper part of the clearance hole is formed in the upper plate and an annular boss having a threaded hole and having a length sufficient to fit in the lower part of the clearance hole is formed in the lower plate so that the three pieces are connected in one piece by threading a tapping screw through the counter-sunk hole and the seat portion to the threaded hole.

4,330,069

STEAM PRESSURE COOKER

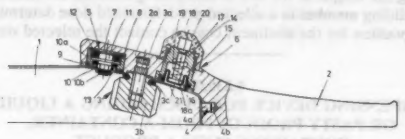
Edwald Bauer, Geislingen, Fed. Rep. of Germany, assignor to Wurttembergische Metallwarenfabrik, Steige, Fed. Rep. of Germany

Filed Jan. 7, 1981, Ser. No. 223,038

Claims priority, application Fed. Rep. of Germany, Jan. 22, 1980, 3002204

Int. Cl.³ B65D *51/16*

U.S. Cl. 220—203 **15 Claims**



1. A steam pressure cooker having a lid and safety and monitoring devices, such as a safety valve, a pressure indicator and/or regulating valve disposed at least partially within sealed cavities of a retainer body, particularly of a grip member or a central housing, said retainer body being releasably attached to said lid by means of a sealed fastener element, characterized in that the components of all safety (**5**) and monitoring devices (**6**) are located in cavities (**7** and **15**, respectively) formed in said retainer body (*2a*) and sealed against the interior of the cooker, and in that said fastener element (**3**) is releasable independently of the remaining components.

4,330,070

RELATING TO DOSE DETERMINING MEANS OF PASTE DISPENSER

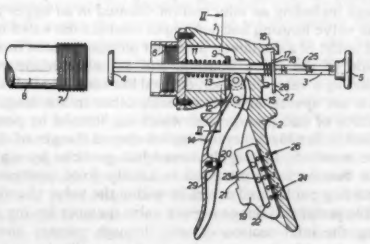
Ian E. Doubleday, Sheffield, England, assignor to Burroughs Wellcome Co., Research Triangle Park, N.C.

Filed Apr. 10, 1980, Ser. No. 138,915

Claims priority, application United Kingdom, Apr. 10, 1979, 7912598

Int. Cl.³ B67D *5/22, 5/46*

U.S. Cl. 222—43 **5 Claims**



1. A paste dose dispenser incorporating a housing, a housing connection on the housing to which a container of paste will be connected, a rod passing through the housing, a plunger connected to the rod and situated within or positioned beyond the housing connection, a first part comprising a handle extending from the housing, a second part comprising a pivoted operating lever linked with the rod and operable in a direction towards the handle so as to move the rod in the direction towards the housing connection and cause the plunger to dispense paste from a container when connected to the dispenser; and dose determining means comprising a sliding member carried by one of the two parts and provided with a slot along the length thereof receiving a mounting boss carried by the said one of the two parts to permit the sliding member to be slidably movable to selected positions which determine different degrees of maximum movement of the lever and thus deter-

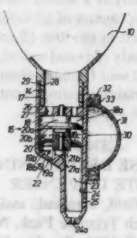
mine maximum doses of paste to be dispensed, an abutment boss adjustably carried by the other of the two parts for fine initial adjustment of the dosage levels and which will contact that part of the sliding member which determines the desired dose, and wherein the sliding member incorporates a stepped surface to be contacted by the abutment boss, with each step determining a maximum degree of movement of the lever, and locating means including ball and detent arrangements on the said one of the two parts and the sliding member symmetrically spaced relative to the steps of said stepped surface and disposed along the length of the slot in said sliding member for holding the sliding member in a selected predetermined dose determining position for the abutment boss to contact the selected step.

4,330,071

DISPENSING DEVICE FOR DISCHARGING A LIQUID OR PASTY PRODUCT FROM A CONTAINER, CONTAINING SUCH A PRODUCT

Gustav O. I. Ohlson, Tranas, Sweden, assignor to AB Tranas Rostfria, Tranas, Sweden

Filed Oct. 15, 1980, Ser. No. 197,196
Claims priority, application Sweden, Oct. 15, 1979, 7908510
Int. Cl.[3] G01F *11/08*
U.S. Cl. 222—207 **8 Claims**



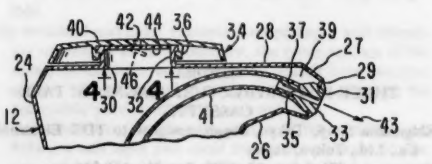
1. A dispensing device for discharging a liquid or pasty product from a container, containing such a product, said device comprising a valve housing, provided with a generally vertically extending through passage for said product, said passage including an inlet section, located in an upper portion of the valve housing and serving to connect the valve housing to an outlet of a container, an outlet section, located in a lower portion of the valve housing, and an intermediate portion, containing a valve chamber, defined between two valve means which are spaced apart from each other in the longitudinal direction of said passage and which are formed by peripheral resiliently flexible generally funnel-shaped flanges of disk-like valve members, having thickened hub portions by which the valve members are mounted in axially fixed positions on a supporting pin located centrally within the valve chamber, the flexible peripheral flange of each valve member having its apex facing the inlet section of said through passage and being arranged, with its outer edge, to bear sealingly against the peripheral wall of the valve chamber, as long as any substantial pressure drop does not occur across said flange in a direction from its upper side and towards its lower side, while the flange is arranged, upon the occurrance of a pressure drop of sufficient magnitude across the same and in said direction, to be bent resiliently in a downward direction in order to define, between its outer edge and the peripheral wall of the valve chamber a gap through which a flow of said product may pass, the device further comprising a pressure means, located outside the valve housing and communicating with the valve chamber through an opening provided in the peripheral wall of the valve chamber, said pressure means being arranged, upon actuation thereof, temporarily to generate an increased pressure within the valve chamber, hereby causing a discharge of a certain quantity of said product from the valve chamber to the outlet section of the through passage, past the lower valve means, characterized in that the supporting pin for the two valve members is formed integrally with the valve housing which, as a whole, is formed as one single piece, the supporting pin projecting upwardly and into the valve chamber from a partial bottom wall of the valve housing, partially closing the valve housing in a downward direction but leaving, at one side of the supporting pin, a free opening which terminates into an outlet passageway, formed in a portion of the valve housing projecting in a downward direction from said bottom wall, the supporting pin having a lower portion of enlarged cross-section, the upper end of which forms a shoulder on which the hub portion of the lower valve member rests with its lower end surface, the hub portion of the upper valve member being held in contact with the hub portion of the lower valve member by a retaining means, acting against the upper end surface of the hub portion of the upper valve member and provided in an axially fixed position within the inlet section of the through passage, above the upper valve member.

4,330,072

DISPENSER WITH SIDE SPOUT FOR FLOWABLE MATERIAL

Gary J. Mastman, Saratoga, Calif., assignor to National Dispenser Company, Santa Barbara, Calif.

Continuation-in-part of Ser. No. 928,581, Jul. 27, 1978, abandoned, which is a continuation-in-part of Ser. No. 852,139, Nov. 16, 1977, Pat. No. 4,146,154, said Ser. No. 852,139, is a continuation of Ser. No. 683,628, May 5, 1976, abandoned. This application Feb. 22, 1980, Ser. No. 123,619
Int. Cl.[3] B05B *11/04*
U.S. Cl. 222—209 **30 Claims**



1. A material dispenser comprising: a container having a generally vertical axis and adapted to be supported on a support surface, said container having a side wall having a corrugation that is collapsible in a direction along said axis when the container is on said support surface to permit reduction of the volume of the container, said container adapted to receive a flowable material to be dispensed, the container having a spout extending laterally therefrom, the spout having an opening at the outer end thereof, the container having an upper surface extending transversely of said axis, said upper surface being substantially flat throughout substantially its entire area to permit a downward force to be exerted on said upper surface to collapse side wall when the container is on said support surface, at least a portion of the upper extremity of the spout being substantially coextensive with said upper surface; and a tube placing the spout in fluid communication with the interior of the container below the material level therein, whereby the material in the container will be dispensed therefrom when a downward force is exerted on said upper surface to collapse said container to reduce the volume thereof.

4,330,073

CAMERA ACCESSORY BAG

Gary L. Clark, 2916 Evergreen Ave., Salt Lake City, Utah 84109

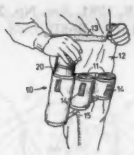
Filed Dec. 19, 1980, Ser. No. 218,058
Int. Cl.[3] A45C *11/38*
U.S. Cl. 224—223 **5 Claims**

1. A carrying case for camera accessories, comprising in combination:

a flexible backing panel constructed of padded material;

a plurality of flexible cylindrical compartments constructed of padded material, with each compartment being individually attached in a side-by-side relationship to said backing panel and having open tops and closed bottoms;

flap covering means attached at one edge thereof to said backing panel for extending over the tops of said compartments;



closure means for securing said flap means to said compartments, such that said flap means can be both laterally and vertically adjusted for a snug fit; and

padding means which is adjustable in height for disposition in the bottom of said compartments.

4,330,074

APPARATUS FOR AUTOMATIC WELDING OF BEVELLED TUBES

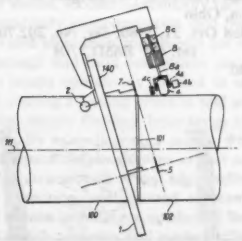
Andre E. Minkiewicz, Fontenay aux Roses, and Norbert Poirier, Paris, both of France, assignors to Compagnie Francaise des Peteroles and Etudes Petrolieres Marines, both of Paris, France

Division of Ser. No. 892,355, Mar. 31, 1978, Pat. No. 4,213,555. This application Jan. 23, 1980, Ser. No. 114,526

Claims priority, application France, Mar. 31, 1977, 77 09824

Int. Cl.³ B23K *37/02*

U.S. Cl. 228—29 **25 Claims**



1. Apparatus for welding the bevelled edges of two tubes, said tube bevels having no root faces, comprising: an inverted channel-section frame, welding means, mounting means for mounting said welding means on said frame, and alignment means for causing alignment between a reference plane of said frame and the tube meeting plane, said alignment means displacing said frame until said reference plane is parallel to said tube meeting plane at a predetermined distance from said tube meeting plane, wherein said alignment means includes first, second and third bearing means (2,3,4) said first and second bearing means bearing on an upper part of one of the two tubes to be welded, said third bearing means serving as an attitude corrector by bearing on the other tube, said third bearing means lying in the plane of symmetry of said first and second bearing means, said first, second and third bearing means positioning the machine automatically.

4,330,075

SOLDERING TOOL WITH FEEDER MECHANISM

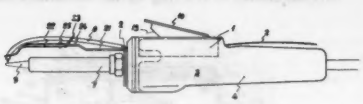
Kurt J. Rosen, Kyrkhultsvägen 22, S-280 70 Lönsboda, Sweden

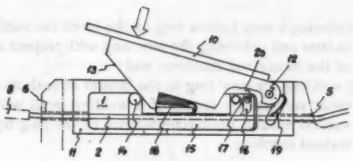
Filed Mar. 13, 1980, Ser. No. 129,856

Claims priority, application Sweden, Mar. 16, 1979, 7902367

Int. Cl.³ B23K *3/06*

U.S. Cl. 228—53 **5 Claims**





1. A soldering tool comprising, in combination; a handle; a heating element; and a soldering tip at one end of the handle; a solder passage formed by the handle and extending between rear and front openings; a solder-feeding mechanism within the handle in said passage for advancing solder towards said heating element, and including an attachment piece in the handle; a slide displaceably guided by the attachment piece; spring means biasing the slide in a direction opposite to a feeding direction of solder through the passage; a slide control member pivotably attched to the attachment piece and accessible for manual operation from outside of the handle, said slide control member forming an inclined surface for engagement with the slide and displacement thereof against the spring means upon pivoting said member with respect to the handle; a driving dog on the slide for advancing the solder upon displacement of the slide against the spring bias, and a stationary latch member on the attachment piece for gripping the solder upon displacement of the slide under the spring bias; the solder-feeding mechanism further comprising a bracket supported by the handle, and extending along the heating element, said bracket including a first element connected to the handle at one end thereof; and a second element supported by the first element to be adjustable to selected positions along the heating element; and a guide tube for receiving and guiding solder supplied from the front opening of the passage around the heating element to the soldering tip; said guide tube being supported by said second element and extending towards the soldering tip, said bracket allowing adjustment of the guide tube in the longitudinal direction of the heating element towards and away from the soldering tip.

4,330,076

METHOD FOR REPLACING BOLSTER RINGS

Glen R. Lollis, 10405 Mockingbird Dr.; Marvin G. Marler, 9926 Orchard Ave., both of Omaha, Nebr. 68127; Joe P. Car, 5114 California St., Omaha, Nebr. 68132, and Sam J. John, 6208 Parker, Omaha, Nebr. 68104

Filed Jul. 22, 1980, Ser. No. 171,121

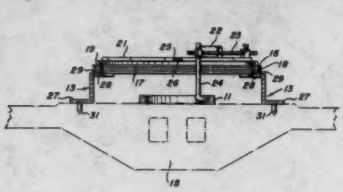
Int. Cl.³ B23K *31/02*

U.S. Cl. 228—119 **3 Claims**

1. A method of replacing a worn bolster ring on a freight car truck bolster which contains two pairs of mounting holes for side bearing cages which are spaced laterally from the axis of said ring a uniform distance, the method comprising the steps of

(a) mounting on the top of the bolster a motorized circle cutting and welding machine, utilizing said pairs of mounting holes to establish and maintain coincidence between the axis of the machine and the ring;

(b) cutting the ring from the bolster along a plane parallel with, but spaced slightly above, the top of the bolster by means of a cutting torch which is advanced around the circumference of the ring by the motorized machine;



(c) placing a new bolster ring on the torch cut surface of the bolster and centering the new ring with respect to the axis of the motorized machine; and

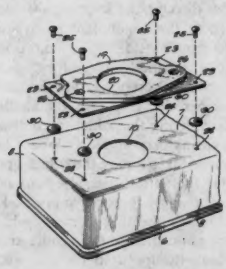
(d) welding the new ring to the bolster at both its inner and outer surfaces by means of a welding head which is advanced around the circumference of the ring by the motorized machine.

4,330,077

METHOD OF SOLDERING RADIATOR TANKS

Fred M. Young, Racine, Wis., assignor to Young Radiator Company, Racine, Wis.

Filed Apr. 11, 1980, Ser. No. 139,358
Int. Cl.³ B23K *31/00*
U.S. Cl. 228—139 **2 Claims**



1. In the method of uniting a reinforcing member to the bottom wall member of a radiator by a metallic bonding agent applied to said members while in a molten state, which method conventionally involves forming alignable rivet-receiving holes in said members at a number of spaced apart areas thereof, inserting rivets in aligning ones of said holes and upsetting the rivets with sufficient force to draw opposing surfaces of said members in contiguity, the improvement of said method which assures a mechanically strong leakproof joint between said members through practice of the following steps:

A. prior to the riveting operation, placing thin spacers of substantially the same metallic bonding agent between said members at locations closely adjacent to each of said rivet holes to thereby establish a slight uniform space between said members through which said molten bonding agent can readily flow by capillary action;

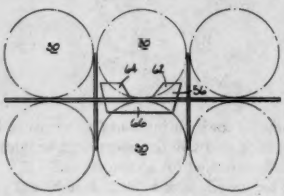
B. after each riveting, applying said molten bonding agent to the periphery of the reinforcing member to cause it to flow by capillary action over all of the overlying surfaces of said members and to thereby utilize the heat of such molten bonding agent to melt said spacers and thus cause the melt thereof to penetrate into all interstices between the rivets and the sides of the holes in which they are received.

4,330,078

ABBREVIATED HEIGHT PARTITION

Earl J. Graser, Monroe, La., assignor to Manville Service Corporation, Denver, Colo.

Filed Jan. 9, 1981, Ser. No. 223,601
Int. Cl.³ B65D *5/48*
U.S. Cl. 229—15 **6 Claims**



1. An insertable vertical abbreviated height partition for a wrap-around beverage carrier for a plurality of bottles positioned in adjacent cells of the carrier, comprising:

(a) an elongated longitudinal partition structure having at least two hinged transverse partition elements formed therein; and

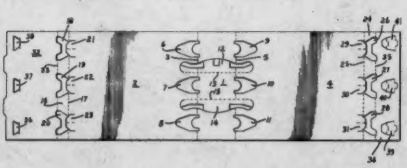
(b) a hinged tab formed on the bottom edge of the elongated longitudinal partition structure and extending on opposite sides of the partition structure into adjacent partition cells for partial engagement of the tab beneath at last a portion of adjacent bottles contained in the carrier in cells adjacent to the elongated longitudinal partition structure.

4,330,079

INTERLOCKING STRUCTURE FOR A PAIR OF OVERLAPPING PANELS

Prentice J. Wood, Hapeville, Ga., assignor to The Mead Corporation, Dayton, Ohio

Filed Oct. 31, 1980, Ser. No. 202,708
Int. Cl.³ B65D *5/04*
U.S. Cl. 229—40 **13 Claims**



1. Interlocking structure for a pair of overlapping panels comprising a locking aperture formed in one of said panels and having an anchoring edge and a securing edge spaced from said anchoring edge and generally parallel thereto, and a locking tab having a body portion, a heel portion, and a toe portion and being struck from the other of said panels near an edge thereof and folded through an angle of approximately 180° and into face contacting relation with the part of said other panel which is disposed adjacent said edge thereof and so as to cause said heel portion to enter said locking aperture and to engage said anchoring edge and to cause said toe portion to enter said locking aperture adjacent said securing edge so that when the lock is formed the body portion of the locking tab is disposed in enveloping face contacting relation with the edge portion of the panel from which the locking tab is struck.

4,330,080

SEPARATOR FOR AN ULTRACENTRIFUGE

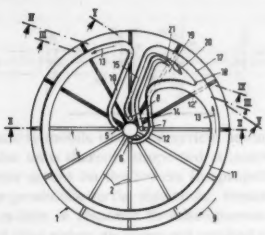
Bernd Mathieu, Spiesen, Fed. Rep. of Germany, assignor to Dr. Eduard Fresenius, Chemisch-pharmazeutische Industrie KG Apparatebau KG, Bad Homburg, Fed. Rep. of Germany

Filed Nov. 13, 1980, Ser. No. 206,447

Claims priority, application Fed. Rep. of Germany, Nov. 30, 1979, 2948177

Int. Cl.³ B04B 5/00

U.S. Cl. 233—27 10 Claims



1. A separator for separating the components of a fluid into a number of fractions in an ultracentrifuge, comprising a first substantially circular plate member having a central rotational axis, a second plate member forming a cover so that said first and second plate members form a housing, ring channel means in said housing extending along a substantial portion of the circumference of said housing, fluid inlet means arranged in said housing substantially centrally thereof relative to said rotational axis, first substantially radially extending duct means operatively interconnecting said fluid inlet means to one end of said ring channel means for feeding fluid into said ring channel means, fluid component outlet means arranged in said housing also substantially centrally thereof relative to said rotational axis, separation zone means located radially outwardly in said housing opposite the other end of said ring channel means so that the other end of the ring channel means merges into said separation zone means, second substantially radially extending duct means operatively interconnecting said fluid component outlet means to said separation zone means for removing fluid components through said fluid component outlet means, and separator edge means operatively located in said separation zone means for causing a peeling effect in said separation zone means, said edge means forming boundaries of said second substantially radially extending duct means where the latter merge into said separation zone means so that said second cut means are located downstream of said edge means as viewed in the fluid flow direction, said second substantially radially extending duct means including a number of second ducts of different radial length whereby said peeling effect is repeated.

4,330,081

WATER TEMPERATURE CONTROL SYSTEM FOR A CLOTHES WASHING MACHINE

Stephen L. McMillan, Louisville, Ky., assignor to General Electric Company, Louisville, Ky.

Filed Dec. 3, 1979, Ser. No. 99,453

Int. Cl.³ G05D 23/00; G05B 11/32

U.S. Cl. 236—12 R 3 Claims

1. Water temperature control system for a clothes washing machine comprising:

control means for establishing a control effect representative of a desired water temperature for use in the clothes washing tub;

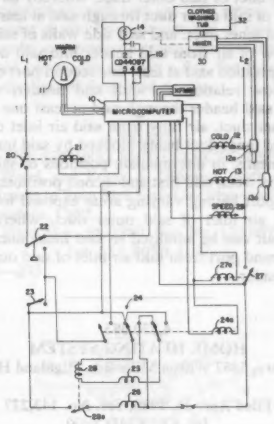
first and second valve means for supplying incoming cold and hot water, respectively;

mixing means for combining the water flow from the valve means before entry into the clothes washing tub;

means for sensing the temperature of the combined water flow before entry into the tub;

means for determining the cumulative average temperature of said combined water flow;

means for periodically comparing said average temperature to said desired temperature to determine the difference between said two temperatures;



and means responsive to said comparing means when said difference exceeds a predetermined amount for actuating said valve means to cause said combined water temperature to change in the direction of approaching said desired temperature.

4,330,082

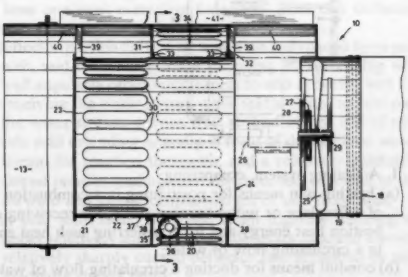
AIR MIXING APPARATUS

Wilfred W. Wilson, Toronto, Canada, assignor to Frank Sloan, Toronto, Canada

Filed Apr. 13, 1981, Ser. No. 253,704

Int. Cl.³ G05D 23/13

U.S. Cl. 236—13 11 Claims



1. Air mixing apparatus comprising an outer duct having side walls, an air inlet through which air can be drawn into said duct, an air outlet through which air can exit from said duct and at least one first port in said side walls for passage of air into said duct; an inner duct movably mounted within said outer duct, said inner duct having side walls, said inner duct having at least one second port in said side walls of said inner duct through which air can pass into said inner duct, said inner duct also having an air outlet through which air can exit from said inner duct, said air outlets of said inner and outer ducts being in air-flow relationship, whereby air exiting from said air

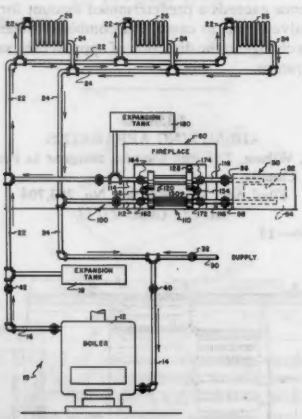
outlet of said inner duct then exits from said air outlet of said outer duct; air baffle means extending between said outer and inner ducts on either side of said at least one first port and with said inner and outer ducts defining a header into which air can pass through said at least one first port; means for relatively moving said inner and outer ducts back and forth between a first position and a second position, in said first position said at least one second port communicating in air-flow relationship with said air inlet of said outer duct, whereby air passes from said air inlet of said outer duct through said at least one second port into said inner duct, and said side walls of said inner duct blocking flow of air from said header into said inner duct, in said second position said at least one second port communicating in air-flow relationship with said header, whereby air passes from said header through said at least one second port into said inner duct, air flow from said air inlet of said outer duct into said inner duct being blocked by said inner duct and said baffle means, in intermediate positions of said outer and inner ducts between said first and second positions said at least one second port having varying areas exposed to said header and to said air inlet of said outer duct, whereby varying amounts of air can be admitted to said inner duct via said at least one second port from said air inlet of said outer duct and from said header.

4,330,083

HOME HEATING SYSTEM

Dante Di Fiore, 5387 Wilson Mills Rd., Highland Heights, Ohio 44143

Filed Apr. 24, 1980, Ser. No. 143,277
Int. Cl.³ F24D *3/00*
U.S. Cl. 237—56 **8 Claims**



1. A heating system, comprising:

(a) heating unit means for positioning in a combustion zone of a fireplace or wood-burning stove, for receiving combustion heat energy and for transferring such heat energy to a circulating flow of water;

(b) conduit means for ducting a circulating flow of water to and from the heating unit means to effect transfer to heat energy from the combustion zone to a remote location;

(c) the heating unit means including:

(i) an upper chamber-defining portion configured to overlie a part of the combustion zone so that water contained in the upper portion is heated by combustion gases and flames impinging on the outer surface of the upper portion;

(ii) a lower chamber-defining portion configured to underlie a part of the combustion zone and to support fuel for combustion;

(d) first valve means for selectively communicating the heating unit means with a heat-energy-consuming appliance capable of utilizing heat energy supplied via a circulating flow of water;

(e) second valve means for selectively communicating the heating unit means with a circulating hot water home heating system whereby the heating unit means can be utilized to deliver heat energy to the home heating system;

(f) riser conduit means communicating the upper and lower chamber-defining portions; and,

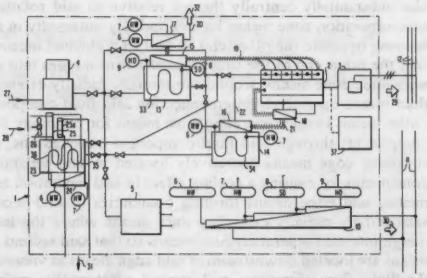
(g) third valve means for controlling the flow of water through the riser conduit means.

4,330,084

METHOD FOR OPERATING A HEATING POWER PLANT AND HEATING POWER PLANT FOR CARRYING OUT THE METHOD

Helmut Buchner, Wendlingen, and Otto Bernauer, Weinstadt, both of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

Filed Feb. 1, 1979, Ser. No. 8,260
Claims priority, application Fed. Rep. of Germany, Feb. 18, 1978, 2807075
Int. Cl.³ F24D *1/00*
U.S. Cl. 237—12.1 **28 Claims**



1. A method of operating a heating power plant containing a thermal power installation producing mechanical motive driving energy as well as waste heat for heating purposes, the method comprising the steps of:

maintaining the thermal power installation at a predetermined load condition during periods of low energy needs;

introducing hydrogen into a metal hydride storage means capable of absorbing hydrogen chemically reversably bound therein during periods of low energy needs;

utilizing the binding enthalpy releasable from the hydride storage means for heating purposes during periods of low energy needs;

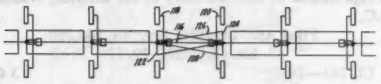
operating the thermal power installation at high load conditions at times of higher energy needs; and

removing hydrogen from a metal hydride storage means capable of releasing hydrogen by supplying a waste heat from at least ambient air so as to obtain a required release enthalpy for the hydride storage means during periods of higher energy needs.

4,330,085
LATERALLY MOBILE IRRIGATION SYSTEM

David A. Siekmeier; Glen L. Andersen, both of Columbus, Nebr.; Arthur L. Zimmerer, deceased, late of Lindsay, Nebr. (by Bernadette Zimmerer, executor); by First National Bank and Trust Company, executor, Columbus, Nebr., and William P. Zimmerer, San Luis Obispo, Calif., assignors to Lindsay Manufacturing Company, Lindsay, Nebr.

Continuation of Ser. No. 955,941, Oct. 30, 1978, abandoned.
This application Oct. 6, 1980, Ser. No. 194,565
Int. Cl.³ A01G *25/09*
U.S. Cl. 239—1 43 Claims



1. In a linearly mobile irrigation system having a pipe string with sprinkler units thereon, supported at intervals by mobile towers, motor means on the towers for propelling them in a direction perpendicular to the pipe string, means for activating the tower motors in response to misalignment between segments in the pipe string; an improved method of steering said mobile irrigation unit comprising the steps of:

(1) independently driving at least two master towers at equal primary rates according to a prechosen program;

(2) dependently driving all other slave towers by activating the slave tower motors at such times as required to maintain the pipe string substantially in a straight line;

(3) sensing the overall location of the system with reference to a designated path;

(4) generating a correction signal when the system strays from the path;

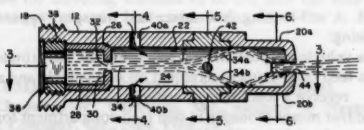
(5) utilizing the correction signal to alter the primary rate of advancement of at least one master tower thus establishing differential rates for the master towers which cause the entire system to pivot in the desired direction; and

(6) releasing the correction signal to return the altered master tower to its primary rate as soon as the system begins to return to the designated path.

4,330,086
NOZZLE AND METHOD FOR GENERATING FOAM

Leonard N. Nysted, Highland Park, Ill., assignor to Duraclean International, Deerfield, Ill.

Filed Apr. 30, 1980, Ser. No. 145,344
Int. Cl.³ B05B *7/04*; A62C *5/06*
U.S. Cl. 239—8 12 Claims



1. A foam generating nozzle comprising:

a nozzle body having upstream and downstream ends and an inner wall defining a passage within said nozzle body;

a nozzle inlet at said upstream end of said nozzle body for introducing a liquid foam producing agent into said passage;

orifice means positioned within said passage downstream of said nozzle inlet, said orifice means having an axis extending in a direction parallel to said nozzle body, said orifice means having a dimension smaller than the diameter of the passage through said nozzle body, said orifice means being adapted to form a stream of foam producing agent in said passage when the foam producing agent is introduced into said nozzle inlet and through said orifice means;

gas inlet means in said nozzle body downstream of said orifice means for introducing a gas into said passage;

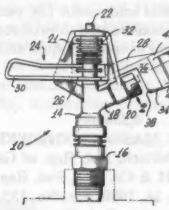
pin means disposed transversely across said passage, said pin means being substantially circular in cross-section and being positioned downstream of said gas inlet means for splitting the stream of foam-producing agent into expanding secondary streams which pass to each side of said pin means and are directed outwardly from said axis to effect a thorough mixing of the foam producing agent and the gas introduced through said gas inlet means; and

a nozzle outlet at said downstream end of said nozzle, said nozzle outlet comprising a transverse slot disposed parallel to said pin means so that a flat, fan-shaped spray of foam is discharged from said nozzle.

4,330,087
IMPULSE SPRINKLER DEFLECTOR SPOON

William A. Wood, and Frank J. D'Amore, both of Glendora, Calif., assignors to Rain Bird Sprinkler Manufacturing Corporation, Glendora, Calif.

Filed Mar. 24, 1980, Ser. No. 133,007
Int. Cl.³ B05B *3/02*
U.S. Cl. 239—233 11 Claims



1. A deflector spoon for an impulse sprinkler including a nozzle arm for receiving any one of a plurality of nozzles, and means for urging said deflector spoon into engagement with a water stream from the nozzle, said deflector spoon comprising:

a deflector web including an upstanding wall extending generally radially away from the nozzle and having an angularly disposed rear face for engagement with the water stream and for thereupon drawing said web into and past the water stream;

at least one strut extending forwardly from said deflector web away from the nozzle; and

a deflector portion carried by said strut and spaced from said web, said deflector portion including an upstanding side wall angularly offset with respect to said deflector web for receiving the water stream when said web has moved past the water stream, a front wall at the forward end of said side wall extending laterally in front of the received water stream for reaction therewith, and a relatively gradually sloped ramp extending centrally from said side wall to the forward and lateral central margin of said front wall;

said side wall, front wall, and ramp together defining an upper relatively sharply curved deflector face and a lower relatively sharply curved deflector face separated by said gradually sloped ramp.

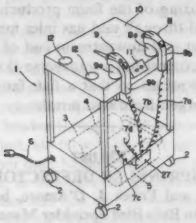
4,330,088
MULTISPRAY SYSTEM FOR BEAUTY TREATMENT

Masaya Koyama, 4-21-4, and Katsuyuki Hanaoka, 4-12-3, both of Kizuri, Higashiosaka-shi, Osaka-fu, Japan

Filed Dec. 28, 1979, Ser. No. 108,134
Claims priority, application Japan, Mar. 30, 1979, 54-38833
Int. Cl.³ B05B *7/30*
U.S. Cl. 239—318 3 Claims

1. A miltispray system for beauty treatment having a beauty treatment wagon (1), a motor (3) mounted on said wagon (1),

a pump (4) mounted on said wagon (1) to be driven by said motor (3), at least two pipes (*7a, 7b*) for sending compressed air, a compressed air tank (5) for reserving compressed air from said pump (4), at least one atomizing spray (8) connected to said pipe (*7a*) and at least one foam spray (9) connected to the other pipe (*7b*), coupling means (27) of fitted-in type for connecting each of said pipes (*7a, 7b*) to said compressed air tank



(5), said atomizing spray (8) and said foam spray (9) being respectively provided with a control valve (13) for providing or interrupting flow of the compressed air supplied through said pipes (*7a, 7b*) and with a control valve operating means (14), characterized in that said motor (3), pump (4) and compressed air tank (5) are constructed to produce compressed air having sufficient pressure to spray a liquid and said foam spray (9) has a pressure regulator valve (19).

4,330,089

ADJUSTABLE MASSAGE SHOWER HEAD

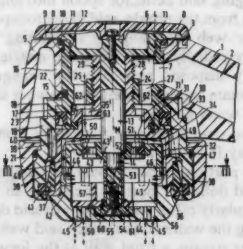
Werner Finkbeiner, Schiltach, Fed. Rep. of Germany, assignor to Hans Grohe GmbH & Co. KG., Fed. Rep. of Germany

Filed Mar. 24, 1980, Ser. No. 133,593

Claims priority, application Fed. Rep. of Germany, Mar. 23, 1979, 2911405

Int. Cl.³ B05B *1/34*

U.S. Cl. 239—383 **13 Claims**



1. An adjustable massage shower head comprising:

a housing defining a liquid input chamber for receiving a liquid;

a flow guide mounted for axial movement in said housing defining a liquid flow passage from said input chamber and a turbine chamber;

a spray bottom connected to said flow guide and defining one wall of said turbine chamber having openings therethrough;

a rotor valve rotatably mounted to said housing and in said turbine chamber, said rotor valve having a cutout-segment and being rotatable over said openings to produce a pulsating spray of liquid leaving said turbine chamber as said cutout-segment passes over said openings;

a ring wall connected to said flow guide between said liquid flow passage and said turbine chamber having at least one obliquely extending duct therethrough and

means for axially moving said flow guide in said housing to move said spray bottom and ring wall with said at least one duct from a position with said duct directing liquid from said flow passage to a portion of said rotor valve, to a position where said duct directs liquid to an increased portion of said rotor valve, whereby the pulsating spray is increased in frequency.

4,330,090

METHOD FOR WROUGHT AND CAST ALUMINUM SEPARATION

Dominic Montagna, Baltimore, and Harry V. Makar, Ellicott City, both of Md., assignors to The United States of America as represented by the Secretary of the Interior, Washington, D.C.

Filed Apr. 14, 1980, Ser. No. 140,380

Int. Cl.³ B02C *19/12*

U.S. Cl. 241—14 **3 Claims**

1. A method of separately recovering wrought aluminum and cast aluminum from a scrap mixture of the two comprising the steps of:

heating the scrap mixture to a temperature near the solidus temperature of the cast aluminum scrap;

hot crushing the heated scrap in an impact apparatus so that the cast aluminum is fragmentized while the wrought aluminum is flattened; and

separating the two types of aluminum by screening.

4,330,091

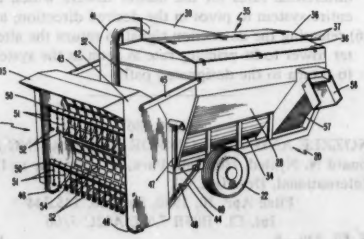
SELF-LOADING FEED MIXER AND TRANSPORT APPARATUS

Antonie G. Rozeboom, R.R. No. 1, Doon, Iowa 51235, and John H. Van Beek, R.R. No. 1, Rock Valley, Iowa 51247

Filed Sep. 24, 1979, Ser. No. 78,027

Int. Cl.³ B02C *13/26*

U.S. Cl. 241—73 **47 Claims**



1. A self-loading feed mixer and transport apparatus, comprising:

a vehicle adapted to be transported on the ground;

a feed compartment mounted on said vehicle and adapted to receive a load of feed material;

mixer means mounted in said feed compartment for agitating and mixing the feed material therein; and

feed grinding and loading means mounted on said vehicle and positioned outside of said feed compartment to engage a stack of feed material on the ground, said grinding and loading means including

a housing mounted outside of said feed compartment;

a plurality of flail-like pulverizing members mounted on a rotatable shaft within said housing for thrashing the stack of feed material;

a screen member spaced from said rotatable shaft within said housing and cooperable with said pulverizing members for grinding the feed material upon rotation of said shaft; and

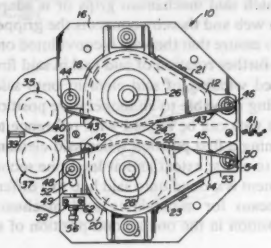
means for loading the ground feed material into said compartment.

4,330,092

IN-LINE SHREDDER APPARATUS

Walter A. Roman, Norwalk, Conn., assignor to The Perkin-Elmer Corporation, Norwalk, Conn.

Filed Dec. 7, 1979, Ser. No. 101,391
Int. Cl.[3] B02C *18/18, 18/40*
U.S. Cl. 241—232 4 Claims



1. Sherdder apparatus:
a. a base plate
b. a first housing fixed to said base plate,
c. a second housing,
d. bearing means disposed through said second housing and said base plate pivotally mounting said second housing on said base plate,
e. screw means disposed through said second housing normally tightened to hold said second housing fixed relative to said first housing,
f. a first blade assembly including a plurality of spaced blades connected to said first housing,
g. a second blade assembly including a plurality of spaced blades connected to said second housing,
h. said first and second housings being disposed with respect to each other so that the blades in said first and second blades assemblies and contact each other,
i. a block fixed to said base plate,
j. an adjustment screw threadly engaging said second housing through said block to move said housing about said bearing means to vary the amount of overlap between the blades in said first and second blade assemblies when said screw means is loosened,
k. means in said second housing to move said second blade assembly axially with respect to said first blade assembly to control the loading in the areas of contact between blades of said first and second blade assemblies,
l. means for rotating said first and second blade assemblies to provide a cutting operation, and
m. means for directing material to be cut into the area of contact between said blade assemblies.

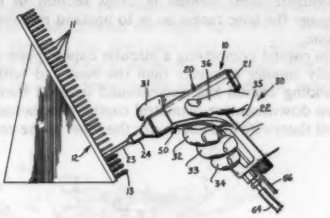
4,330,093

THUMB-CONTROLLED HAND-HELD TOOL

Ivan B. Chapman, Jr., Baltimore, Md., assignor to Western Electric Company, Inc., New York, N.Y.

Filed Aug. 8, 1980, Ser. No. 176,610
Int. Cl.[3] B21F *3/04*
U.S. Cl. 242—7.17 5 Claims

1. A hand-held tool, said tool comprising:
a housing which includes a handle portion having a grip formed on a forward end thereof and a barrel having a working portion, said barrel adapted to be held in a user's hand;
means for operating said working portion;
a rest separate from said grip disposed laterally of said working portion and connected to said handle portion, said rest having a surface which is sufficiently close to a user's thumb for supportively engaging the user's thumb when the user's fingers engage the grip and a port which opens to said surface, said surface being configured to allow the thumb to cover and to uncover said port in a repetitive manner with insubstantial movement of proximal and distal phalanges of the user's thumb; and
means connected to said port and to said means for operating



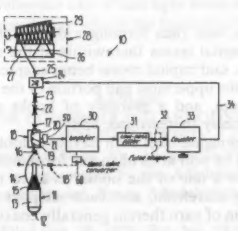
said working portion and responsive to the covering and to the uncovering of said port with the user's thumb for causing the operation and the discontinuance of the operation of said tool.

4,330,094

METHOD AND APPARATUS FOR MEASURING THE LENGTH OF A THREAD WITHDRAWN OVERHEAD FROM A THREAD CARRIER

Stephan Mayer, Im Ried, 8112 Otelfingen, Switzerland

Filed Mar. 10, 1980, Ser. No. 128,560
Claims priority, application Switzerland, Mar. 26, 1979, 2763/79
Int. Cl.[3] B65H *63/00, 63/08*
U.S. Cl. 242—36 13 Claims



1. A method of measuring the length of a thread withdrawn overhead from a thread carrier, in particular a spinning cop or a random cross-wound bobbin, comprising the steps of:
keeping the thread carrier stationary;
withdrawing the thread from overhead of the thread carrier, thus causing the thread detachment point at the thread carrier to perform a movement, such movement comprising an axially reciprocating component;
generating a signal which periodically varies in accordance with the axially reciprocating component of the movement of the thread detachment poin at the thread carrier; and
counting the cycles of the fundamental frequency of such signal.

4,330,095

FREE STANDING, MULTIPLE SKEIN YARN HOLDER AND DISPENSER

Gilbert J. Carter, 525 Park Blvd. #43, Ogden, Utah 84401

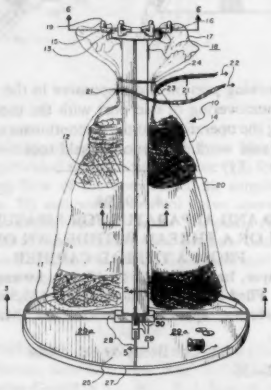
Filed Jul. 30, 1980, Ser. No. 173,740
Int. Cl.[3] B65H *49/00;* D01H *7/16*
U.S. Cl. 242—129.5 11 Claims

8. A free standing yarn dispenser comprising:
a lowermost base comprising a circular base plate with an upstanding base rim therearound integral therewith and

two upstanding diametral base ribs thereacross integral therewith and each with the other at the center of the base plate, said ribs forming an upwardly opening cruciform base recess therewithin at the center of the base plate;

an elongate stem formed in cross section to frictionally engage the base recess so as to upstand removably therefrom;

a stem capital comprising a circular capital plate of substantially smaller diameter than the base end with a downstanding capital rim therearound integral therewith and two downstanding diametral capital ribs thereacross integral therewith and each with the other at the center of the



capital plate, said rims forming a downwardly opening cruciform capital recess therewithin at the center of the capital plate, said capital recess being adapted to frictionally engage the uppermost end portion of the stem removably therefrom, and a plurality of hooks spaced apart circumferentially therearound; and

a plurality of elongate bags each having a hooking perforation through its wall at its open end for removable securement each to a one of the hooks so as to be supported downwardly therefrom, and each adapted to retain an elongate skein of yarn therein generally coaxially with the bag.

4,330,096

APPARATUS FOR WINDING OR UNWINDING WEBS OF PHOTOSENSITIVE MATERIAL OR THE LIKE

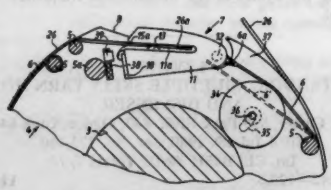
Siegfried Bartel, Gauting; Bernd Payrhammer, Munich, and Erich Nagel, Anzing, all of Fed. Rep. of Germany, assignors to AGFA-Gevaert Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Oct. 1, 1980, Ser. No. 192,906

Claims priority, application Fed. Rep. of Germany, Oct. 27, 1979, 2943488

Int. Cl.³ B65H *75/28*

U.S. Cl. 242—74.1 **36 Claims**



1. Apparatus for storing and paying out webs of flexible material, such as photographic film or photographic paper, comprising a rotary reel having a hub; an elongated flexible attaching element having a first portion secured to said hub and a second portion, said reel being rotatable in first and second directions to respectively wind said element onto and to permit unwinding of said element from said hub; a coupling unit secured to said second portion of said element and including a clamping mechanism normally assuming an operative position in which said mechanism grips or is adapted to grip the leader of a web and thereby connects the gripped leader to said element to ensure that the web is convoluted onto said hub in response to further rotation of said reel in said first direction upon completed winding of said element onto said hub, said mechanism being movable to an inoperative position in which the leader of a web can be moved with reference to said unit, said unit assuming a first position when said element is wound onto said hub to a first extent and at least one second position when said element is wound onto said hub to a different second extent; and means for maintaining said mechanism in said inoperative position in the one second position of said unit.

4,330,097

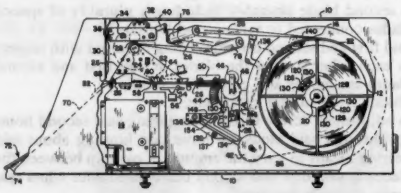
VARIABLE FORCE INERTIAL ARM WINDING CONTROL SYSTEM

Mark S. George, and Arthur W. Stucke, both of Dayton, Ohio, assignors to Hobart Corporation, Troy, Ohio

Filed Aug. 11, 1980, Ser. No. 177,299

Int. Cl.³ B65H *59/38*; G03B *1/04*; G11B *15/32*

U.S. Cl. 242—187 **11 Claims**



1. In a system having a rotatably mounted supply reel, a supply roll of a web of material wound on said supply reel, and web drive means for transporting said web of material, a reel actuating device for causing unreeling of said web of material from said supply reel, which decreases the radius of said supply roll, comprising:

a stationary mounting means,

an actuator arm pivotally mounted at a first end thereof to said stationary mounting means,

a web contacting roller mounted on a second end of said actuator arm and engaged with said web at a location between said web drive means and said supply reel for applying a web unreeling force to said web,

supply roll follwer means, pivotally mounted on said stationary mounting means and extending to a position in contact with the periphery of said supply roll, said position of said roll follower means changing in response to decrease in the radius of said supply roll as said web of material is unreeled from said supply reel, and

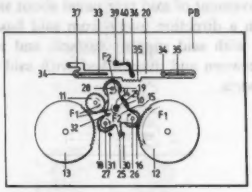
spring means, mounted on said stationary mounting means and cooperating with said supply roll follower means, for applying a spring force to said actuator arm at a point intermediate said first and second ends thereof which, in turn, causes said applying of said web unreeling force by said web contacting roller to said web, said spring and web unreeling forces varying in magnitude in dependence upon the position of said supply roll follower means.

4,330,098

GEAR DRIVING MECHANISMS CHANGING THE LAST GEAR THEREOF UPON EACH REVERSAL OF THE DIRECTION OF THE MOTOR MEMBER

Giovanni Santoro, Via Campodimele 55, Roma, Italy

Filed Mar. 31, 1980, Ser. No. 135,337
Claims priority, application Italy, Apr. 3, 1979, 48606 A/79
Int. Cl.[3] G03B *1/04*; G11B *15/32*
U.S. Cl. 242—201 6 Claims



1. A driving mechanism for transmitting the rotative drive of a motor member, automatically changing the last gear thereof upon each reversal of the direction of rotation of said motor member, comprising: a drive gear wheel associated to said motor member; a first gear wheel utilizing the movement of said motor member or first final gear wheel, a second gear wheel utilizing the movement of said motor member or second final gear wheel; a bottom plate supporting said drive and final gear wheels; a primary gear wheel in mesh with said drive gear wheel and mounted on a shaft fixedly supported on said bottom plate; a swinging support fitted on said stationary shaft of said primary gear wheel so as to freely rotate in respect thereto; a first blocking pin adapted to engage said swinging support during the angular movement thereof in order to define a first angular position of said swinging support; a second blocking pin adapted to engage said swinging support during the angular movement thereof in order to define a second angular position of said swinging support; and, a first and a second last gears each pivotally mounted on a shaft supported by said swinging support so as to be meshed with said primary gear wheel, the parts described being so arranged that when said swinging support is in said first angular position, said first last gear is in mesh with said first final gear wheel and when said swinging support is in said second angular position, said second last gear is in mesh with said second final gear wheel and, furthermore, when said swinging support is in an intermediate position between said first and second angular positions, said first and second last gears abut the teeth of said first and second final gear wheels, respectively, without being meshed therewith, the angular movement of said swinging support from said intermediate position to either said first or said second angular position depending on the direction of rotation of said primary gear wheel.

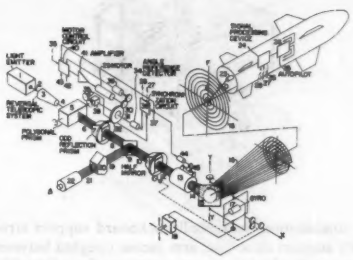
4,330,099

SYSTEM FOR GUIDING FLYING VEHICLES WITH LIGHT BEAM

Hiroshi Sogo, and Nobuo Yoshino, both of Utsunomiya, Japan, assignors to Fuji Jukogyo Kabushiki Kaisha, Japan

Division of Ser. No. 751,998, Dec. 17, 1976, Pat. No. 4,195,799.
This application Mar. 31, 1980, Ser. No. 135,907
Claims priority, application Japan, Dec. 29, 1975, 50-156298
Int. Cl.[3] F41G *7/26*
U.S. Cl. 244—3.13 1 Claim

1. Apparatus for guiding a flying vehicle, comprising: a light receiver in the flying vehicle; a light emitter at a launch site for emitting a stationary relatively thin light beam; scanning means for scanning the light beam and including a pair of planar mirrors, a short focus lens and long focus lens; means for expanding the stationary light beam by several diameters and directing the expanded light beam to a first of the planar mirrors; means for positioning the second of the planar mirrors relative to the first planar mirror for receiving the expanded beam reflected from the first planar mirror; means for vibrating the first and second mirrors about respective mutually perpendicular axes with respective sinusoidal and cosinusoidal displacements so that a spirally scanning beam is reflected from the second planar mirror; means for directing the spirally scanning light beam toward the light receiver of the flying vehicle and through the short and long focus lenses in that order; means for storing a repetition reference time of the scanning of the light beam in the flying vehicle; means for



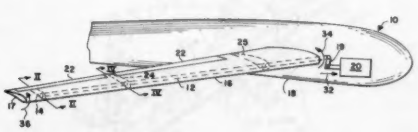
controlling the radiation angle of the scanning light beam according to the lapse of time after launching of the flying vehicle so as to maintain a scanning area of the scanning light beam on the light receiver constant; and means for guiding the flying vehicle to be on the center of the light beam according to information on a displacement of the flying vehicle from the center of the light beam and information on a displacement angle from a reference axis of said light beam determined from a period of time during which the light receiver receives the light beam.

4,330,100

MEANS FOR CONTROLLING AERODYNAMICALLY INDUCED TWIST

Wolf Elber, Newport News, Va., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Sep. 28, 1979, Ser. No. 79,913
Int. Cl.[3] B64C *3/52*
U.S. Cl. 244—48 2 Claims



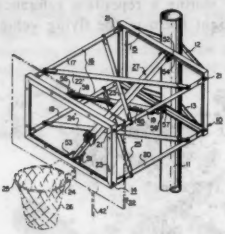
1. An aircraft having a wing twist mechanism comprised of a single torque tube disposed internal to each of the wings attached to the aircraft fuselage, each said torque tube having an inboard end and an outboard end, said torque tubes being rigidly attached to wing structural members near the tip of each wing at the outboard end thereof, and an actuator attaching the inboard end of each said torque tube to the aircraft fuselage, said actuator comprising an electrically actuated solenoid, said solenoid being attached to a rotatable arm member and said arm member being secured to said torque tube, and means for elastically attaching said torque tube to wing structural support members at intermediate wing positions, whereby adjustment of the actuator will activate said solenoid and rotate said arm member and induce twist in the aircraft wings via said torque tubes.

4,330,101

BASKETBALL BACKBOARD SUPPORT APPARATUS

Frank L. Andersen, Logan, Utah, assignor to Equalizer, Inc., Logan, Utah

Filed Oct. 31, 1979, Ser. No. 89,945
Int. Cl.[3] E04G 3/00; A63B 63/00
U.S. Cl. 248—284 7 Claims



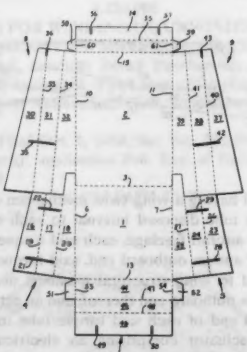
1. In combination, basketball backboard support structure, stationary support structure, arm means coupled between and pivoted to each of said support structures for adjustably connecting said backboard support structure to said stationary support structure whereby said backboard support structure can be raised and lowered relative to said stationary support structure, means for releasably fixing the vertical disposition of said backboard support structure relative to said stationary support structure, and fluid cylinder means for braking backboard support structure descents relative to said stationary support structure, and wherein said releasably fixing means comprises a telescoping brace provided with ratchet means, automatically actuatable through lifting said backboard support structure, for releasably shortening the length of said brace.

4,330,102

MERCHANDISING DISPLAY

James L. Gebhardt, Roswell, and Ferris L. Hutchins, Jr., Doraville, both of Ga., assignors to The Mead Corporation, Dayton, Ohio

Continuation of Ser. No. 48,901, Jun. 15, 1979, abandoned. This application Oct. 20, 1980, Ser. No. 198,658
Int. Cl.[3] A47B 97/04
U.S. Cl. 248—459 11 Claims



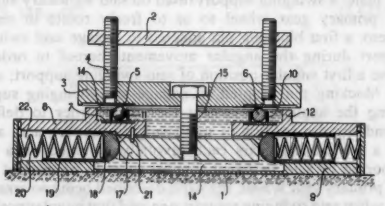
9. A merchandising display arranged for mounting on a support surface and formed from one or more blanks of foldable material comprising a base portion and a rear portion secured directly to an edge of said base portion and extending generally upwardly therefrom, said base portion including a base panel, a series of horizontal support panels joined to the side edges of said base panel and folded downwardly and inwardly to form tubular horizontal supports underneath said base panel, said rear portion including a rear panel, a series of vertical support panels joined to the side edges of said rear panel and folded independently of said horizontal support panels rearwardly and inwardly to form tubular upright supports the lower edges of which are disposed in the same plane as the lower edges of said horizontal supports for preventing swinging movement of said rear panel about said edge of said base panel in a direction away from said base panel due to engagement with said support surface, and reinforcing ribs extending between and interlocked with said horizontal and upright supports.

4,330,103

EARTHQUAKE PROTECTOR

Edmond Thuries, Meyzieu; Jean-Paul Sadoulet, Lyons, and Denis Dufournet, Villeurbanne, all of France, assignors to Delle-Alsthom, Villeurbanne, France

Filed Feb. 12, 1980, Ser. No. 120,603
Claims priority, application France, Feb. 16, 1979, 79 04010
Int. Cl.[3] A47B 97/04; F16M 13/00
U.S. Cl. 248—548 1 Claim



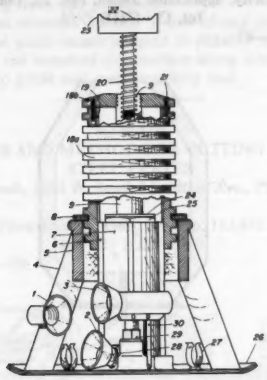
1. Earthquake protector for protecting apparatus such as a circuit-breaker mounted on at least one support member positioned on the top of the protector and supporting the apparatus, the improvement wherein the protector comprises a base member positioned at the base of the protector for fast connection to a foundation, a plate assembly positioned between the support member and the base member, said plate assembly comprising first and second plates horizontally movable relative to the base member, said first plate being connected to the support member by jacks and having a first sole plate on its lower surface, a second sole plate on the upper surface of the base member, said first sole plate engaging said second sole plate, means for presenting to the plates a very low coefficient of friction to relative horizontal motion, said second plate being fast with said first plate and connected thereto by connection means passing through corresponding openings in the sole plates, said second plate engaging said base member by at least one spring for opposing relative horizontal motion therebetween and being made fast therewith by means of a pin of predetermined shear strength such that said pin breaks when the base member is subjected to an acceleration exceeding a given threshold, and wherein said sole plate engaging means comprising bearing balls held in place by a cage, thereby providing said very low coefficient of friction, and wherein said at least one spring comprises a helical spring wrapped around its periphery in a torus shape, said torus shaped spring being received in a housing in said base member, and wherein at least said second plate, said sole plates, and said at least one spring are immersed in a bath of damping fluid.

4,330,104

HYDRAULIC JACK AND STAND COMBINATION WITH KEY AND HINGED HANDLE

Henri Klok, P.O. Box 13714, Houston, Tex. 77019

Filed Jan. 23, 1979, Ser. No. 5,837
Int. Cl.³ B66F 3/24
U.S. Cl. 254—93 H 1 Claim



1. I claim an integrated construction whose improvement comprises a conventional hydraulic jack combined with a simple triangulated steel stand with three engaging legs that commence at a steel base plate and project upwards to reengage at a steel ring that circumscribes a conventional hydraulic jack which has a modified bearing assembly that connects by means of a U-shaped and separate key to the aforementioned steel ring, thereby allowing a load to be distributed to the stand; said modified bearing assembly is of an inverted cylinder construction whose exterior is formed in consecutively arranged support ribbing whose purpose is to engage said separate key at predetermined locations according to desired height to be maintained once said load is transferred to said stand construction; said modified inverted cylinder is attached to the bearing ram of said conventional jack by means of machined threads and screws to provide a stable continuity to the bearing ram which is maintained to be pumped up by means of a fluid retention cavity and manually applied pressures; said steel stand assembly is hence combined to form an integrated structure with the additional features of selectively applied funnels whose sole purpose are to guide a steel handle to three locations of jack or stand function as listed herein; to engage a funnel on one of the stand's three legs so that said hydraulic jack and its contiguous stand could be moved about without entering a person or operator beneath said load, to engage the funnel that would guide said handle to the housing of the pumping mechanism standard on conventional hydraulic jacks, to engage said handle through the aid of a third and final funnel that would allow said handle to engage the fluid retention valve common to conventional hydraulic jacks.

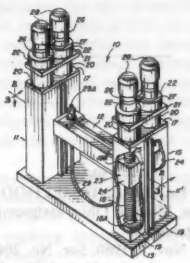
4,330,105

CRANE TYPE LIFTING ASSEMBLY FOR HEAVY LOADS

Roger W. Gallagher, Scottsdale, Ariz., assignor to Reliance Truck Company, Phoenix, Ariz.

Filed Apr. 10, 1980, Ser. No. 139,101
Int. Cl.³ B66F 7/14
U.S. Cl. 254—89 R 10 Claims

1. A lifting mechanism for cargo comprising:
a verticaly positioned frame defining a slot extending longitudinally thereof,
a pair of screws juxtapositioned in said frame to extend longitudinally thereof one on each side of said slot,
each of said screws being journaled on said frame to rotate in tension under load,
a nut threadedly associated with each screw for movement longitudinally thereof,
saddle means for interconnecting each nut,
motor means mounted on said frame one for each screw,
gear reduction means interconnecting each motor means with each shaft,
means for synchronizingly interconnecting each of said motor means for operating both screws in unison for



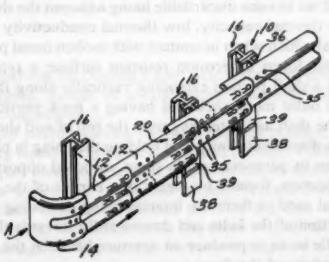
moving said nuts along their respective screws in side by side arrangement, and
a lift beam,
said lift beam comprising attachment means formed at one end thereof for extending through said slot and resting on said saddle means,
said slot closely confining said attachment means to prevent substantial external movement thereof,
whereby movement of each of the nuts along its respective screw moves the attachment means of said lift beams up or down within said slot along said frame.

4,330,106

GUARD RAIL CONSTRUCTION

Douglas B. Chisholm, 1906 Memory Ct., Vienna, Va. 22180

Filed May 2, 1979, Ser. No. 35,297
Int. Cl.³ E01F 15/00
U.S. Cl. 256—13.1 29 Claims



1. A guard rail system comprising
a plurality of rail elements having characteristics for redirecting impacting vehicles;
a curved rail end mounted to one of said rail elements and forming a termination of said plurality of rail elements;
a plurality of vertical posts for supporting said rail elements in a substantially horizontal position;
means for mounting at least the post closest to said rail end so that said post will break away upon an axial impact of said rail end but will not fail upon an impact in other directions;
means for attaching said rail elements to each other in overlapping relationship so that said rail elements will move

axially with respect to each other upon an axial impact, but will maintain full tensile strength for maintaining their redirectional characteristics upon other than axial impacts, said means comprising first bolt means and surface means of said rail elements for receiving said first bolt means so that upon axial impact said connecting means will be laterally displaced and ejected; and

second bolt means for attaching said rail elements to said posts.

4,330,107

TEAPOT LADLE AND METHOD OF USE

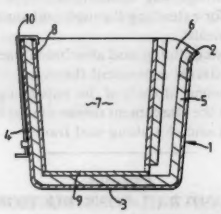
C. Richard Lynham, Medina, Ohio, assignor to Foseco Trading A.G., Chur, Switzerland

Filed Nov. 7, 1980, Ser. No. 204,948

Claims priority, application United Kingdom, Jul. 8, 1980, 8022253

Int. Cl.³ B22D *41/04, 41/02;* C21C *7/00*

U.S. Cl. 266—44 **30 Claims**



17. A teapot ladle comprising: an outer metal shell; a lip portion through which molten metal is poured when the ladle is tilted; an interior discardable lining adjacent the shell formed of low thermal capacity, low thermal conductivity refractory material which when in contact with molten metal poured into the ladle forms an erosion resistant surface; a retaining rod having a shaft portion extending vertically along the exterior of said outer metal shell and having a hook portion integral with the shaft and extending over the top of said shell, and the top the discardable lining and holding the lining in place at one point on its perimeter; and a spout, disposed opposite the rod hook portion, formed by means of a barrier of the refractory material used to form the interior lining extending across the lip portion of the ladle and downwardly towards the floor of the ladle so as to produce an aperture between the bottom of the barrier and the floor.

23. A method of utilizing a teapot ladle to cast molten metal, the ladle having an outer metal shell and a spout extending from the floor of the ladle to a lip portion, comprising the steps of sequentially: disposing a discardable interior lining, formed of low thermal capacity, low thermal conductivity refractory material, within the ladle, completely covering the ladle interior; retaining the discardable lining in place during tilting action of the ladle; pouring molten metal into the ladle, without preheating of the ladle; tilting the ladle and pouring the molten metal from the ladle through the spout of the ladle into a mould or another vessel; terminating retention of the discardable lining in place upon tilting of the ladle; and tilting the ladle so that the interior discardable lining falls out.

4,330,108

METHOD FOR COOLING TUYERES

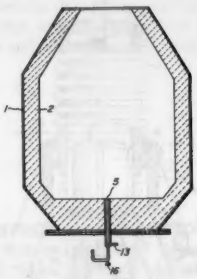
Kyoji Nakanishi, Chiba; Kenji Saito, Togane; Yoshiei Kato, Chiba; Tsutomu Nozaki, Chiba, and Toshihiko Emi, Chiba, all of Japan, assignors to Kawasaki Steel Corporation, Kobe, Japan

Filed Feb. 24, 1981, Ser. No. 237,626

Claims priority, application Japan, Feb. 27, 1980, 55/22813

Int. Cl.³ C21B *7/16*

U.S. Cl. 266—47 **1 Claim**



1. In a method for cooling tuyeres when molten iron is refined by blowing a refining gas containing oxygen by setting tuyeres below or above the meniscus of iron bath in a vessel for refining the molten iron, wherein concentric tuyeres are used and a refining gas containing oxygen gas is blown through an inner pipe of the concentric tuyere and a fluid for protecting the tuyeres is blown through the outer pipe of the tuyere so that the protecting fluid surrounds the refining gas in a sheath form to cool top ends of the tuyeres and prevent the wear of the tuyeres, the improvement comprising using a mixture of at least one member of the group consisting of carbon dioxide gas, carbon dioxide liquid and a mixture of carbon dioxide gas and liquid, and carbon fine particles as the protecting fluid, molar ratio of carbon to carbon dioxide being 0.5–1.0.

4,330,109

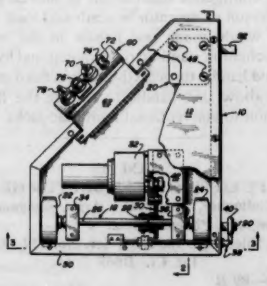
HEAVY DUTY CARRIAGE ASSEMBLY

William J. Coughlin, Lancaster; David E. Johnson, Pataskala, and Kenneth E. McCall, Lancaster, all of Ohio, assignors to Arcair Company, Lancaster, Ohio

Filed Feb. 13, 1981, Ser. No. 234,229

Int. Cl.³ B23K *7/10*

U.S. Cl. 266—67 **9 Claims**



1. A heavy-duty carriage assembly for supporting and guiding a metal-working tool along a fixed path comprising in combination:

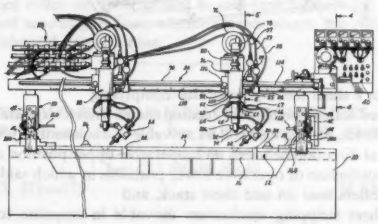
a tool supporting platform having the shape of a polygon with at least two perpendicular sides;
a pair of wheels depending from said platform and positioned adjacent to one of said perpendicular sides;
a leading wheel depending from said platform adjacent to the other of said perpendicular sides;
means to drive at least one of said wheels, said drive means depending from said platform;
guide means mounted parallel to one of said perpendicular sides, said guide means adapted to slidably engage a thin elongate rail mounted on a surface along which said carriage is to guide said metal-working tool.

4,330,110

APPARATUS AND METHOD FOR CUTTING HOLES IN STEEL PLATES

Clyde W. Creech, 2243 W. South Mountain Ave., Phoenix, Ariz. 85041

Filed Jan. 21, 1980, Ser. No. 113,471
Int. Cl.³ B23K *7/10*
U.S. Cl. 266—70 **11 Claims**



1. Apparatus for cutting an aperture in a workpiece with a cutting torch, said apparatus comprising in combination:
(a) rotational drive means for rotating the cutting torch about an axis of rotation to cut the perimeter of the aperture, said rotational drive means including a block, a spindle rotatably mounted within said block, electric motive means for rotating said spindle, said spindle including a vertically positionable sleeve slidable along the axis of rotation of said spindle to adjust the height of the cutting torch and a lock means for locking said sleeve in place with respect to said spindle; and
(b) translating means for translating said rotational drive means rectilinearly a predetermined distance with respect to the workpiece during an initial rotational movement of the cutting torch, the joint operation of said rotational drive means and said translating means acting upon the cutting torch to define a spiral cut made from a point interior of the perimeter of the aperture to the perimeter of the aperture.

4,330,111

MULTI-PURPOSE IN-LINE DIRECT HEAT TREATING EQUIPMENT FOR HOT ROLLED STEEL WIRE ROD

Kyoichiro Matsuoka; Nobuyasu Irie; Satoshi Inoue, all of Hikari; Katsuto Ito, Yamaguchi, and Isao Yata, Hikari, all of Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed Oct. 1, 1980, Ser. No. 192,837
Claims priority, application Japan, Oct. 16, 1979, 54-133215
Int. Cl.³ C21D *9/56*
U.S. Cl. 266—106 **4 Claims**

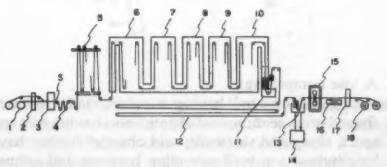
1. Multi-purposed in-line direct heat treating equipment for heat treating a hot-rolled steel wire rod, which equipment comprises, in combination:
an inlet end conveyor for receiving wire rod emerging from a hot rolling mill in the form of a continuous coil of non-concentric overlapping rings;
a front traveling skid carriage adjacent the downstream end of said inlet and conveyor;
a front stage conveyor on said front traveling skid carriage and extending in the same direction as said inlet end conveyor;
a holding furnace on said front traveling skid carriage side-by-side with said front stage conveyor, said front traveling skid carriage being movable transversely of the direction in which said inlet end conveyor transports the wire rod for aligning either the front stage conveyor or the holding furnace with said inlet end conveyor;
a rear traveling skid carriage adjacent the downstream end of said front traveling skid carriage;
a rear stage conveyor on said rear traveling skid carriage and extending in the same direction as said inlet end conveyor;
a quenching tank and a holding tank on said rear traveling skid carriage and positioned one behind the other and side-by-side with said rear stage conveyor, said rear traveling skid carriage being movable transversely of the direction in which said inlet end conveyor transports the wire rod for aligning either the rear stage conveyor or the quenching tank and the holding tank with said inlet end conveyor;
an outlet end conveyor adjacent the downstream end of said rear traveling skid carriage and aligned with said inlet end conveyor; and
a cooling and washing apparatus above and below said outlet end conveyor.

4,330,112

APPARATUS FOR COOLING A STEEL STRIP IN A CONTINUOUS ANNEALING LINE

Tohoru Toshimitsu; Norichika Nagira, and Kenji Ueda, all of Kitakyusyushi, Japan, assignors to Nippon Steel Corporation, Tokyo and Nittetsu Plant Designing Corporation, Kitakyusyushi, both of, Japan

Filed Dec. 27, 1979, Ser. No. 107,622
Claims priority, application Japan, Dec. 29, 1978, 53-162813
Int. Cl.³ C21D *1/64*
U.S. Cl. 266—115 **9 Claims**



3. An apparatus for cooling a steel strip being delivered from the overageing section of a continuous annealing line, said apparatus comprising:
a first step cooling device having a vertical passage, a first cooling liquid spraying device in said passage, a first cooling liquid immersion tank at the lower end of said passage and in which the lower end of said vertical passage is positioned below the normal level of the first cooling liquid in said immersion tank, the upper end of said vertical passage having means for preventing entry of the atmosphere around the vertical passage into the vertical passage, means operatively associated with said first cooling liquid immersion tank for maintaining the first cooling liquid at a constant temperature in the range of 95°–65° C. whereby self-drying can take place, means connected between said first cooling liquid immersion tank and said first cooling liquid spraying device for circulating the first cooling liquid thereto, and means for passing the steel strip through said vertical passage and through said first cooling liquid immersion tank;
a looper for receiving steel strip from said first step cooling device;
a second step cooling device to which said looper delivers steel strip, said second step cooling device having a second cooling liquid spraying device, a second cooling

liquid immersion tank below said second cooling liquid spraying device, means connected to said second cooling liquid immersion tank for circulating the second cooling liquid immersion tank for circulating the second cooling liquid to said second cooling liquid spraying device, refrigeration means for cooling the circulated second cooling liquid to a temperature at least as low as 40° C., and means for passing the steel strip past said second cooling liquid spraying device and through said second cooling liquid immersion tank.

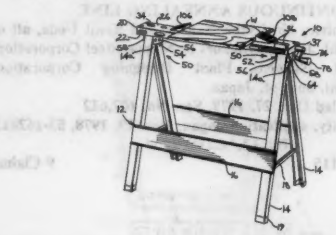
9. An apparatus as claimed in claim 3 in which the second cooling liquid is temper rolling liquid, and said apparatus further comprises means for supplying temper rolling liquid to said second cooling liquid immersion tank from a reservoir for supplying temper rolling liquid to a temper rolling mill to which the steel strip is fed from said second step cooling device.

4,330,113

VISE

Irwin J. Ferdinand, Glencoe; Richard Sylvan, Glenview, and Michael Peterson, Evanston, all of Ill., assignors to Hirsh Company, Skokie, Ill.

Filed Apr. 29, 1980, Ser. No. 141,073
Int. Cl.³ B25B *1/10*
U.S. Cl. 269—88 **5 Claims**



1. A vise comprising:

an elongated channel having a substantially inverted U-shaped cross section; said channel also having two spaced-apart, elongated sidewalls; said channel further having a longitudinal top wall extending between and connecting said sidewalls; each of said channel top and sidewalls defining a plurality of longitudinally spaced channel apertures;

at least one removable stationary jaw for engaging a portion of a workpiece and having a foot for detachably engaging said channel through one of said channel top or sidewall apertures;

a hand crank extending from said channel;

a threaded shaft connected to said hand crank and extending into said channel;

a drive assembly disposed within said channel and connected with said shaft; said drive assembly defining (1) a drive assembly aperture opening toward one of said channel sidewalls, (2) a drive assembly aperture opening toward the other of said channel sidewalls, and (3) a drive assembly aperture opening toward said channel top wall;

each said channel sidewall and channel top wall defining an elongate channel slot at the crank end of the channel, each said channel slot being generally in registry with an adjacent drive assembly aperture; and

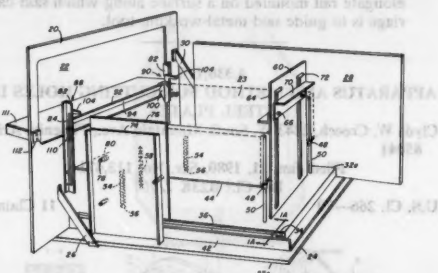
a removable adjustable jaw for engaging a portion of a workpiece opposite said removable stationary jaw, said removable adjustable jaw having a foot for detachably engaging one of said drive assembly apertures when said removable adjustable jaw foot has been inserted through one of said channel slots and into said one drive assembly aperture.

4,330,114

SHEET DELIVERY APPARATUS WITH HORIZONTAL PLATE

Peter M. Coombs, P.O. Box 311, Wilton, N.H. 03858; Gary W. Playdon, 22 Henry Taylor St., Salem, N.H. 03079, and Jeffrey J. Koczela, New Boston Rd., Goffstown, N.H. 03045

Filed Apr. 28, 1980, Ser. No. 144,248
Int. Cl.³ B65H *3/30*
U.S. Cl. 271—22 **2 Claims**



1. In a sheet feeding apparatus comprising

a feed roller assembly for feeding sheets from a large stack of sheets, having feed rollers movable in a substantially vertical direction between an inoperative upper position and a continuum of operative lower positions in which said feed rollers bear on said sheet stack, and

a sheet stripping mechanism movable in response to the position of said feed roller assembly,

the improvement comprising:

a sheet supporting assembly having:

an upwardly biased, substantially horizontal sheet stack support plate vertically movably mounted in said sheet supporting assembly, said plate being movable in response to the weight of said sheet stack and the force of said feed rollers bearing thereon in said operative lower positions, and

resilient bias means for applying an upward bias to said plate, said bias means having an effective spring constant in the vertical direction that is substantially less than a constant feed position force,

whereby as the number of sheets in a stack supplied by said sheet stack support plate decreases, the stack plate moves in an upward direction by a distance less than the thickness of the removed sheets so that the position of the topmost sheet continually lowers.

4,330,115

DISBURSING DEVICE IN MACHINE FOR COUNTING PAPER SHEETS

Shingo Mouri, and Hiroshi Koyama, both of Tokyo, Japan, assignors to Laurel Bank Machine Co., Ltd., Tokyo, Japan

Filed Sep. 4, 1979, Ser. No. 72,557
Claims priority, application Japan, Sep. 5, 1978, 53-108918
Int. Cl.³ B65H *3/52*
U.S. Cl. 271—124 **4 Claims**

1. A disbursement device in a paper sheet counting machine, which comprises:

a feed roller continuously rotated in one direction;

a first brake plate having an arcuate shape conforming to the periphery of the feed roller disposed along the periphery of the feed roller to confront said feed roller, with a first gap between the feed roller and the first brake plate;

first means for adjusting the first gap;

a second brake plate having an arcuate shape conforming to the periphery of the feed roller disposed just behind said

first brake plate and arranged with a second gap between the second brake plate and feed roller;

a single sheet of rubber attached to both of said brake plates; and

second means independent from said first means for adjusting the second gap wherein said two gaps can be adjusted respectively according to the thickness of paper sheets to

be disbursed, the gap adjustment being performed in two stages, the positioning of the first and second brake plates with respect to said feed roller and the adjustment of said first and said second gaps being such that when a plurality of sheets are fed between said first brake plate and said feed roller the sheet closest to said feed roller is fed into said second gap first, whereby paper sheets are reliably disbursed one at a time.

4,330,116

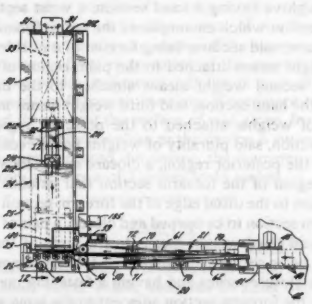
BUNDLING MECHANISM FOR SIGNATURES

John R. Newsome, R.R. #1, Box 58A, Shumway, Ill. 62461

Filed Oct. 20, 1980, Ser. No. 198,344

Int. Cl.³ B65H *29/40*

U.S. Cl. 271—178 **24 Claims**



1. In a bundling mechanism for receiving a stream of signatures in overlapping relation on a generally horizontal conveyor belt and for stacking them in register with one another preparatory to separation into bundles for transfer or storage, the combination of means including a twisting conveyor having an inlet and an outlet for receiving the stream of signatures from the conveyor belt and for conveying them at stream speed while twisting the stream substantially 90 degrees so that the signatures are placed on edge, the outlet of the twisting conveyor being formed of a pair of vertically oriented rollers arranged in opposition to one another to form an outlet nip, a generally horizontal stack supporting table for receiving the lower edges of the signatures and extending at right angles to the direction of the stream to accommodate a horizontally oriented stack having a forming end, a remote stop at the forming end horizontally spaced from the nip for arrest and accumulation of the signatures and against which the leading edges of the accumulating signatures are advanced thereby to establish the remote surface of the stack, the near surface of the stack being horizontally spaced from the nip thereby defining a dead space over which the roller nip is ineffective to transport a signature into contact with the stop and into register with the stack, an auxiliary bridging conveyor located adjacent the nip and in alignment with the stream and driven substantially at stream speed for incrementally conveying the trailing edge of each signature from the nip across the dead space and into a position which is flush with the near surface of the stack and so that the leading edge of the signature is fully conveyed into engagement with the stop, and means for continuously beating upon the forming end of the stack with rapidly repeated blows distributed over the area of the forming end, the blows being applied substantially in unison to facilitate advancement of the stack and sliding of the signatures one over another from the overlapped state into a condition of precise monolithic register.

4,330,117

METHOD AND DEVICE FOR ALIGNING SHEETS TO BE PRINTED IN A PRESS

Günter Weisbach, Radebeul, German Democratic Rep., assignor to VEB Polygraph Leipzig, Kombinat für Polygraphische Maschinen und Ausruestungen, Leipzig, German Democratic Rep.

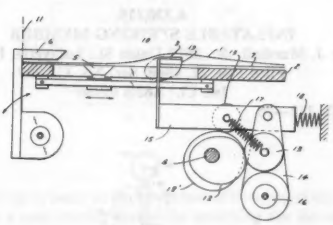
Continuation of Ser. No. 941,139, Sep. 14, 1978, Pat. No. 4,257,586. This application Jun. 23, 1980, Ser. No. 162,103

Claims priority, application German Democratic Rep., Sep. 14, 1977, 201016

The portion of the term of this patent subsequent to Mar. 24, 1998, has been disclaimed.

Int. Cl.³ B65H *9/00*

U.S. Cl. 271—235 **9 Claims**



1. A method of aligning sheets on a feed table in preparation for advancement to a press, comprising the steps of feeding a shingled stream of sheets over the feed table, with a trailing portion of each preceding sheet overlapping a leading portion of the respective succeeding sheet; intercepting each preceding sheet at a stationary pre-alignment line of the feed table, to stop the sheet and effect automatic pre-alignment of its leading edge; advancing the thus pre-aligned preceding sheet, after clearing the way in feeding direction and without losing the pre-alignment, against a stationary final alignment line at a speed approaching zero to effect automatic final alignment of its leading edge; prealigning the succeeding sheet while the preliminary sheet travels to said stationary final alignment line and intercepting the respective succeeding sheet at said pre-alignment line; and releasing the preceding sheet for transportation from the final alignment line to the press and the succeeding sheet for advancement from the pre-alignment line to the final alignment line.

4,330,118

JUMP ROPE

Donald P. Race, 9151 S. Waterford Sq., Greenfield, Wis. 53228

Filed Mar. 5, 1981, Ser. No. 240,883

Int. Cl.³ A63B *5/20*

U.S. Cl. 272—75 **2 Claims**

1. A jump rope comprising:

a. a pair of removable handles;

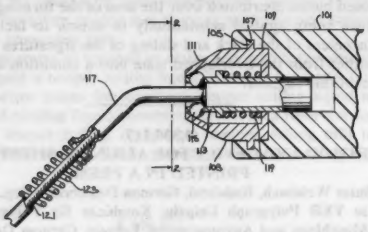
b. a pair of conical fasteners each comprising:

1. an outer shell, one portion of which is a hollow cylinder

and the other portion of which is the frustum of a hollow cone;

2. an inner race which is concentrically located inside the outer shell, said race being movable longitudinally;

3. a plurality of balls uniformly spaced around the circumference of the inner race forming a ring, said balls being free to move radially; and



4. spring means for urging the inner race toward the conical portion of the outer shell;

c. a pair of tubes, each having flares on both ends, and having an angle at a point intermediate its ends, said tube having a first end which may be inserted through the ring of balls or removed therefrom; and

d. cable means attached to a second end of each tube.

4,330,119

INFLATABLE STRIKING MEMBER

LeRoy J. Marshall, Jr., 2519 Union St., Lafayette, Ind. 47904

Filed Feb. 21, 1980, Ser. No. 123,299

Int. Cl.³ A63B *69/00*

U.S. Cl. 272—76 **2 Claims**

1. An exerciser/trainer means, comprising, in combination:

a wall member adapted to be struck by the user;

pressure/force responsive means operatively connected to the wall member;

indicator means operatively connected to the pressure/force responsive means;

the parts being arranged and adapted such that the striking of the wall member is sensed by the pressure/force responsive means, and that sensing is thereupon indicated by the indicator means;

in which the wall member is provided as an inflated body member mounted upon a supporting frame means, and conduit means are provided which operatively interconnect the interior of the inflated body member with the pressure/force responsive means in a manner such that the pressure/force of the striking of the inflated body member is sensed by the pressure/force responsive means;

in a combination in which the supporting frame means includes a hollow pole, opening means being provided in the pole means which cause any increases in pressure of the inflated body member, which are caused in striking of the inflated body member, to cause corresponding increases in pressure within the hollow interior of the pole means, the pole means extending outwardly of the inflated body member and the hollow interior of the pole communicating with the pressure/force responsive means, thereby to cause the indicator means to indicate correspondingly to the effect upon the inflated body member of its being struck.

4,330,120

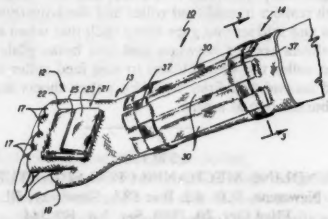
RUNNING OR JOGGING EXERCISING GLOVE

James Netti, 9 Frances St., Auburn, N.Y. 13021

Filed Oct. 16, 1980, Ser. No. 197,556

Int. Cl.³ A63B *21/12*

U.S. Cl. 272—119 **10 Claims**



5. A device for conditioning upper arms and body muscles while running or jogging, wherein said device for each arm includes a glove having a hand section, a wrist section and a forearm section which encompasses the entire forearm region of the wearer, said sections being formed of a pliable material, a first weight means attached to the palm region of the hand section, a second weight means attached to the metacarpal region of the hand section, said third weight means including a plurality of weights attached to the posterior region of the forearm section, said plurality of weights being evenly distributed over the posterior region, a closure means located in the anterior region of the forearm section that extends from the wrist section to the distal edge of the forearm section to permit the forearm section to be opened and closed, a pair of straps for securing said third weight means to the arms of the wearer, each strap being secured to the forearm section adjacent to one side of the closure means and having a fastening means being secured to the forearm section adjacent to the same side of the closure means as said one end of each strap whereby the opposite end of said strap can be wrapped about the arm of the wearer and secured over the closure means and said first and second weight means being of substantially the same weight to permit the arms of the wearer to swing freely.

4,330,121

AERODYNAMIC DRAG ATTACHMENT FOR SWUNG ATHLETIC IMPLEMENTS

James McCafferty, San Diego, Calif., assignor to Swisher Associates, San Diego, Calif.

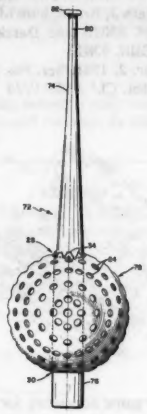
Filed Oct. 2, 1980, Ser. No. 193,020

Int. Cl.³ A63B *69/36, 69/40*

U.S. Cl. 273—26 B **3 Claims**

1. An accessory adapted to be attached to a player swung device to promote the development of muscular strength and/or coordination as said device is swung, the player swung device having a barrel or other shaftlike portion and said accessory being a hollow, thin shelled globe or ball capable of generating an aerodynamic drag which remains essentially constant, or approaches a constant, as said device is swung, means defining a pair of enlarged openings concentric with a

polar axis of said drag generating component through which the shaftlike portion of the player swung device extends, a pair of means for frictionally engaging said accessory to the shaftlike portion of the player swung device, one at each of said openings, each of said pair of means for securing the accessory to the player swung device comprising an annular array of juxtaposed, resiliently deflectable tabs formed in said globe about the enlarged opening, said array being concentric with, and said tabs extending radially inwardly toward, and having their free ends nearest, the polar axis of said globe, each of said



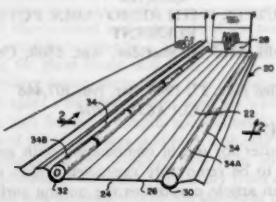
tabs having a major portion of one of its surfaces in face to face, frictional engagement with the surface of the barrel of the player swung device after mounting of the accessory thereon, to thereby assure fixed engagement of the accessory onto the player swung device, and means defining an array of uniformly spaced, equal sized through openings of predetermined diameter formed throughout the surface of said globe, for providing the desired aerodynamic drag as the device is swung with the accessory mounted onto the device, the diameter of said ball being within the range of 2 inches to 18 inches.

4,330,122

CONVERTIBLE BOWLING ALLEY

Zena Sheinberg, and Alex Wortman, both of 526 Pauline Blvd., Ann Arbor, Mich. 48103, assignors to Zena Sheinberg and Alex Wortman, both of Ann Arbor, Mich.

Filed Dec. 28, 1979, Ser. No. 108,033
Int. Cl.³ A63D *5/00*
U.S. Cl. 273—51 **12 Claims**



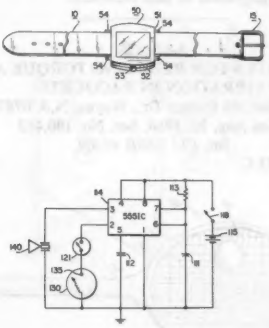
1. An improved bowling alley of the type comprising a bowling lane bed including an approach and a foul line at one end and a pin deck at the other end thereof and a pair of elongated gutters parallel to and abutting each side of said bowling lane bed, wherein the improvement comprises deflection means peripherally configured substantially complementary to the configuration of said gutters, said deflection means being removably disposed within said gutters for deflecting a bowling ball rolled down said alley to thereby prevent said ball from falling into said gutters, said deflection means being releasably held within said gutters solely by the substantially complementary configuration, whereby said bowling alley can serve as a conventional alley when said deflection means are removed from said gutters and can serve as a carom bowling alley when said deflection means are in place.

4,330,123

DEVICES AND METHODS FOR IMPROVING BOWLING SKILLS

Ben Kleinerman, 1760 Stewart Ave., New Hyde Park, N.Y. 11040

Filed Sep. 30, 1980, Ser. No. 192,537
Int. Cl.³ A63B *71/06*
U.S. Cl. 273—54 B **12 Claims**



1. A device to assist in improvement of bowling skills which comprises a case having means for attaching the device to a user's arm in a predetermined orientation; a first acceleration-sensing means capable of making or breaking an electrical circuit; a second sensing means capable of making or breaking an electrical circuit; an electrical power source; and annunciator, the first sensing means making an electrical circuit when a first preselected condition is sensed and the second sensing means making an electrical circuit when a predetermined attitude is sensed, the said second sensing means being electrically connected to said first sensing means wherein the resultant electrical circuit being made by the second sensing means only after making of the circuit by the first sensing means occurs and the electrical circuit made by the second sensing means activating the annunciator.

4,330,124

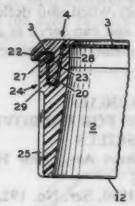
TAMBURELLO

Emilio Vettorello, Centro 20, Bigolino, Italy (31030)

Filed Dec. 5, 1978, Ser. No. 966,633
Claims priority, application Italy, Dec. 6, 1977, 41722 A/77; Oct. 30, 1978, 30844/78[U]
Int. Cl.³ A63B *59/18*; G10D *13/02*
U.S. Cl. 273—67 B **12 Claims**

1. A tamburello for batting game balls comprising a rigid drum having two opposite edges defining two opposite open ends in said drum, a membrane capable of being stretched and tautly secured across one of said open ends, a rim for securing said membrane to said open end of said drum, an outwardly opening annular groove in said drum terminating in the upper portion of the edge defining said one end thereof, a downwardly depending annular wall on said rim, said depending wall being positioned within said annular groove with a pe-

ripheral portion of said membrane therebetween, and wherein said annular groove in said drum and said annular wall of said rim each have members capable of tight snap-fitting interlocking engagement with each other upon assembly of said drum



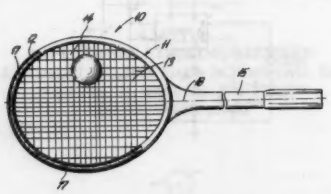
and said rim together such that said membrane is tautly secured between portions of said drum and said rim, said taut securement of said membrane resulting solely from said snap-fitting interlocking engagement of said members.

4,330,125

APPARATUS FOR REDUCING TORQUE AND VIBRATION IN RACQUETS

Marvin L. Sassler, 56 Palmer Dr., Wayne, N.J. 07470

Filed Aug. 22, 1980, Ser. No. 180,412
Int. Cl.³ A63B *49/04*
U.S. Cl. 273—73 C **6 Claims**



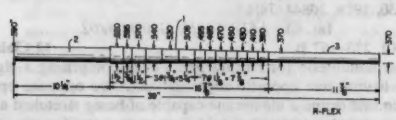
1. A racquet comprising a head portion having a striking surface and a shaft portion having one end connected to said head portion and having a handle at the other end portion, said head portion including a continuous one-piece looped tubular guide means, said guide means being free from internal obstructions; weight means disposed within said guide means so as to be displacable along said guide means, said weight means being of sufficient magnitude and being free to move along and unobstructively throughout said guide means so as to counterbalance the torque and vibration produced by off-center impacts upon said striking surface.

4,330,126

HIGH FLEX GOLF SHAFT HAVING REVERSE TAPERED BUTT SECTION

Joseph W. Rumble, Hartford, Conn., assignor to Brunswick Corporation, Skokie, Ill.

Filed Aug. 30, 1979, Ser. No. 71,037
Int. Cl.³ A63B *53/12*
U.S. Cl. 273—80 R **2 Claims**



1. A standard weight hollow metal, golf club shaft with a grip section at one end; the grip section having a uniform outside diameter which is smaller than the diameter of the immediate adjacent portion of the shaft, whereby the point of shaft deflection during play is located immediately below the grip section,

the metal of the golf club shaft having an after heat treatment yield strength of at least 235,000 lbs/in^2,

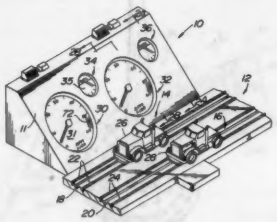
the golf club shaft exclusive of the grip section being tapered with a step pattern chosen from the step patterns specified in FIGS. 1 and 2.

4,330,127

TOY RACING CAR GAME ACCESSORY

Derek A. Brand; Kenneth J. Brand, both of 965 Camino Concordia, Camarillo, Calif. 93010, and Derek R. Brand, 126 Ash Ave., Carpinteria, Calif. 93013

Filed Mar. 2, 1981, Ser. No. 239,768
Int. Cl.³ A63F *9/14*
U.S. Cl. 273—86 B **12 Claims**



1. A toy racing car game accessory for use with an electrically powered toy racing car game having a speed throttle for varying the amount of current which flows to two or more track rails from which a toy racing car motor derives power, comprising:

(a) actuating means adapted for movement in response to variations of the current flow to the track rails, said movement depending on the size and direction of said variations in current flow;

(b) displaceable indicating means for indicating racing car motor speed;

(c) means for displacing said means for indicating car motor speed in either of two opposite directions based on the size and direction of said movement of said actuating means;

(d) displaceable indicating means for indicating simulated fuel consumption of the toy racing car; and

(e) means for displacing said fuel consumption indicating means in one direction in proportion to the displacement of said means for indicating car motor speed.

4,330,128

GOLF PUTTER WITH REMOVABLE PUTTING ELEMENT

Reno T. Morelli, 5415 N. Sheridan, Apt. 5509, Chicago, Ill. 60640

Filed Nov. 17, 1980, Ser. No. 207,446
Int. Cl.³ A63B *53/04*
U.S. Cl. 273—173 **5 Claims**

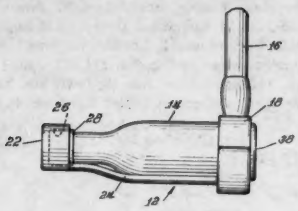
5. A golf putter for use in combination with an elongate article shaped to be removably contained within the putter head and which article constitutes the putting surface when contained within the putter head, the golf putter comprising

(a) the putter head consisting of a generally flat, vertically oriented driving element attached to a putter shaft,

(b) an aperture in said driving element of sufficient dimension to permit passage of the elongate article therethrough,

(c) a receptor shaped to engage one end of the elongate article and retain the elongate article with at least part of the elongate article extends through said aperture and

forms the striking face of said putter head, said receptor being rearwardly spaced from said putter head and



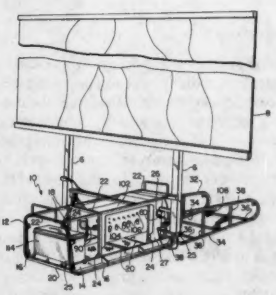
(d) an arm extending between said receptor and said putter head to maintain said receptor in alignment with the axis of said aperture.

4,330,129

LIGHT DUTY TARGET SUPPORT APPARATUS

Brian H. Meredith, Leafield, England, assignor to Australasian Training Aids (Pty.) Ltd., Albury, Australia

Filed Sep. 25, 1980, Ser. No. 190,809
Int. Cl.³ F41J *1/10, 1/20*
U.S. Cl. 273—372 **16 Claims**



1. A lightweight, portable apparatus which is foldable for storage, stackable when folded, and deployable to provide stable support for a planar target member for target shooting, comprising:

(a) a generally box-like main frame, including skid rails extending longitudinally along the bottom of the main frame, upper longitudinal rails generally parellel to the main frame skid rails, upright members connecting the main frame skid rails and the upper longitudinal rails at least at the forward and rear ends of the main frame, and lower cross-bars extending transversely to and interconnecting the main frame skid rails;

(b) a stabilizer frame, including a pair of stabilizer skid rails spaced apart a distance greater than the width of the main frame, and having a length approximately equal to the length of the main frame skid rails, a plurality of cross-bars interconnecting the stabilizer skid rails, and at least one upright member extending upwardly from each stabilizer skid rail at a forward end of the stabilizer frame;

(c) means pivotably connecting each stabilizer frame upright member to a respective upright member at the rear end of the main frame; and

(d) means mounted to the main frame at a rear portion thereof for supporting the planar target,

whereby when the apparatus is deployed for use the stabilizer frame extends rearwardly from the rear end of the main frame to provide a stable framework of approximately double the length of the main frame so as to prevent the apparatus from being tipped over as a result of impact or wind forces against the planar target, and

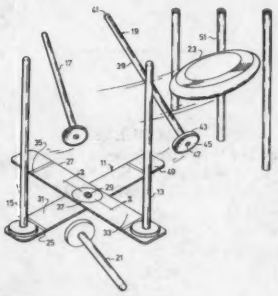
whereby the apparatus may be folded for storage and transport by removing the planar target and pivoting the stabilizer frame upwardly about the connecting means until the stabilizer frame crossbars rest across the upper longutudinal rails of the main frame so that the folded apparatus is only slightly greater in dimension than the main frame.

4,330,130

FLYING SAUCER BOWLING GAME

J. Richard Carr, 27 Midway Ave., Buffalo, N.Y. 14215

Filed Dec. 21, 1979, Ser. No. 106,358
Int. Cl.³ A63B *67/00*
U.S. Cl. 273—393 **19 Claims**



1. A set of game items for playing a simulated bowling game in which a flying saucer is scaled at a target of a plurality of pins with the object being to knock down the pins, which comprises a flying saucer, which is an aerodynamically curved flying toy of inverted saucer-like shape, a support for a plurality of pins, which support is closable to elongated flat strip form to facilitate carrying and storage, is pivotally openable to cruciform or V-shaped use position and includes flat supporting surfaces thereon, and a plurality of pins which include enlarged flat base portions with complementary flat lower mounting surfaces thereon conforming with the supporting surfaces of the supporting member for placement against such supporting surfaces to hold the pins in upright position until knocked down by contact with a flying saucer scaled at them by a player of the game.

4,330,131

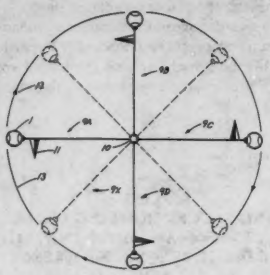
MULTI-TETHERED BALL ASSEMBLAGES AND THEIR USES

Norwood R. Warehime, 704 W. 34th St., Baltimore, Md. 21211

Filed Sep. 26, 1980, Ser. No. 191,083
Int. Cl.³ A63B *67/00*
U.S. Cl. 273—413 **6 Claims**

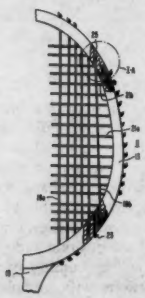
1. Multi-tethered ball assemblages and their uses wherein said assemblages each comprises a plurality of standard type tethered balls attached to a freely positioned central hub means by use of substantially identical flexible connecting lines, said lines having swivel means and fastening means therein to form continuous linkage between said balls and said central hub means, with a small outward vector force from said central hub means tending to keep said connecting lines taut and said balls

moving in a smooth path when said balls are handled in a horizontal circular pattern in group participation by tossing,



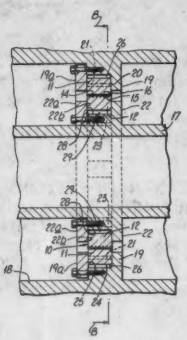
tapping, rolling, bouncing, and passing said balls from person-to-person.

4,330,132
RACQUETS
Harry Ferrari, 144 W. Swissvale Ave., Pittsburgh, Pa. 15218
Filed Sep. 5, 1978, Ser. No. 939,481
Int. Cl.³ A63B *51/00*
U.S. Cl. 273—73 D **3 Claims**



1. A racquet for tennis, squash, racquet ball or the like where in play the racquet strikes a ball, said racquet including a frame of conventional elliptical shape having holes and also including string threaded through said holes, the strings in the center of said frame having the greatest length and the strings extending from the center of said frame to its periphery being progressively shorter, said string being composed of string sections, each section constituting an integral part of a longer string, each section being threaded successively through a plurality of holes in said frame and each section being subject to a predetermined tension, said string sections throughout the frame being so tensioned that the deflection of the string produced by the impact of a ball on said shorter string is substantially equal to the deflection of the string produced by a like impact of said ball on the longer string and means securing each section in at least one of said holes through which it is threaded thus isolating said secured section mechanically from the other sections of the longer string of which said secured section forms an integral part, so that the tension of said section is maintained under the repeated impacts of said ball independently of the tension of other sections of said longer string of which said secured section and said other sections form integral parts.

4,330,133
DUAL-RING SEAL WITH TEMPERATURE COMPENSATION
Jack Palfreyman, Tansley near Matlock; James P. Angus, Stone, and John M. Robertson, Derby, all of England, assignors to Rolls-Royce Limited, London, England
Continuation-in-part of Ser. No. 111,187, Jan. 11, 1980, abandoned. This application Jun. 18, 1981, Ser. No. 274,884
Claims priority, application United Kingdom, Feb. 17, 1979, 7905678
Int. Cl.³ F16J *15/16, 15/44*
U.S. Cl. 277—26 **8 Claims**

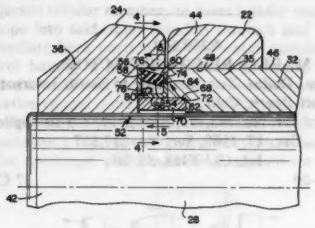


1. A seal arrangement comprising two coaxially mo[illegible]d and axially restrained radially spaced apart relatively rota[illegible]ble members and two concentric, ring-shaped seal elements having adjacent sealing faces and substantially similar rates of thermal expansion, said two seal elements being interposed between said relatively rotatable members, one of each of said seal elements and its adjacent member having a plurality of radially extending projections and the other of each of said seal elements and its adjacent member having a plurality of corresponding recesses to receive and engage said projections in such a manner as to retain said seal elements in coaxial relationship and provide that any radial growth and shrinkage of said relatively rotatable members due to their thermal expansion and contraction is not transferred to said seal elements, said relatively rotatable members being provided with annular retaining means to axially retain said seal elements and provide a seal between each of said seal elements and its adjacent member.

4,330,134
TORQUE LIMITED TRACK PIN SEAL
Kenneth J. Kolinger, Riverside, Ill., assignor to International Harvester Company, Chicago, Ill.
Filed Mar. 31, 1980, Ser. No. 135,481
Int. Cl.³ F16J *15/34*
U.S. Cl. 277—42 **10 Claims**

1. A seal assembly for retaining oil within, and for excluding contaminants from, a sealed region defined at least in part by at least two relatively movable parts and said seal assembly, said seal assembly comprising, in combination, first and second casings made from a relatively rigid, durable material, said casings being spaced apart from each other and arranged for relative movement about a common axis, each of said casings also including means for receiving a portion of an elastomeric seal body, a generally annular, elastomeric seal body unit having spaced apart, first and second surfaces bonded respectively to said means on said casings for receiving said portions of said seal body, each of said casings being adapted to being received within an associated part of said sealable mechanism in fluid tight relation, said seal body being adapted to undergo a predetermined angular degree of torsional deflection caused

by relative rotation of said first and second casings about said common axis, said casings further including mutually engageable means adapted, in one position thereof, for driving engagement with each other, said means being angularly spaced apart to define a circumferential working clearance therebe-



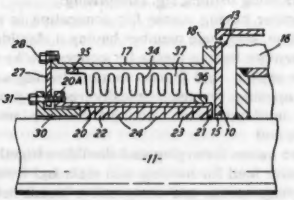
tween, said mutually engageable means being free for movement throughout a range of other positions, said mutually engageable means, in use, being thereby adapted, upon rotation of one of said casings beyond said predetermined degree of rotation, to cause said other casing to rotate together with said one casing about said axis of rotation.

4,330,135

STUFFING BOX WITH BELLOWS TO ALLOW SHAFT GYRATORY MOVEMENTS

John P. Butterfield, Wildwood, Fla., assignor to Jude Engineering Inc., San Francisco, Calif.

Filed Nov. 14, 1980, Ser. No. 207,203
Int. Cl.³ F16J *15/24*
U.S. Cl. 277—102 **4 Claims**



1. A stuffing box comprising a hollow casing to surround a shaft, an end wall attached to one end of the casing, a tubular member located within the casing, bearing rings within said tubular member, and an annular bellows having one circular end fixing in a gas tight manner to the casing adjacent to the end wall and its other circular end surrounding the tubular member and fixed to it in a gas tight manner at the end remote from the end wall.

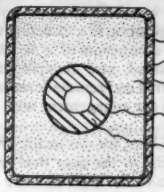
4,330,136

PACKING FOR MAKING CLOSED LOOP SEAL

Robert W. J. Henson, Ashford, England, assignor to The Beldam Packing & Rubber Company Limited, Brentford, England

Filed May 13, 1980, Ser. No. 149,463
Int. Cl.³ F16J *15/06*
U.S. Cl. 277—228 **11 Claims**

1. A resilient packing comprising a resilient core providing complete recovery after compression, a body of weldable fibrous material enclosing the core, a physically protective



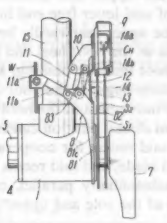
outer layer, and a layer of substantially impervious material between the body and the outer layer.

4,330,137

FRONT DERAILLEUR FOR A BICYCLE

Masashi Nagano, Sakai, Japan, assignor to Shimano Industrial Company Limited, Osaka, Japan

Filed Jul. 22, 1980, Ser. No. 171,187
Claims priority, application Japan, Aug. 15, 1979, 54-112885[U]
Int. Cl.³ B62M *9/12*
U.S. Cl. 280—238 **3 Claims**



1. A front derailleur for a bicycle, which switches a drive chain to a desired one of a plurality of sprockets fixed to a crank supported to a cylindrical bottom bracket of the bicycle and changes the bicycle speed, said front derailleur comprising a fixing member, two linkage members, and a movable member having a chain guide, said fixing member having a plate like connecting portion being fixed to said bottom bracket and an extension extending upwardly from said connecting portion, said extension having at its upper end a pivot portion for pivotally supporting therewith said two linkage members, said pivot portion extending in the axial direction of said bottom bracket and carrying a pair of parallel horizontal pins extending perpendicular to the axial direction of said bottom bracket, each of said linkage members being pivoted at its one lengthwise end to said pivot portion of said fixing member by one of said pins and extending at the other end upwardly with respect to said fixing member, said other end extending upwardly from each of said linkage members to pivotably support said movable member so that said chain guide at said movable member is positioned above said fixing member.

4,330,138

COMBINED SKI BOOT AND SAFETY BINDING ASSEMBLY

Jean J. A. Beyl, Nevers, France, assignor to Look, Nevers, France

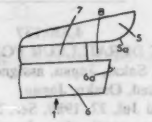
Filed Jan. 7, 1980, Ser. No. 109,840
Claims priority, application France, Feb. 6, 1979, 79 02976
Int. Cl.³ A63C *9/00*
U.S. Cl. 280—630 **9 Claims**

1. In the combination of a ski boot having a sole and an upper, and a safety ski binding for mounting on an elongated

ski blade and adapted to cooperatively retain the heel end of the boot on the ski blade,

a heel clamping member of said binding pivotally mounted for movement between an open position and a closed, boot-engaging position in a direction substantially perpendicular to the elongation of a ski blade on which said binding is mounted, said clamping member including a lever having a free end remote from said pivotal mounting and configured for engagement with the heel end of said ski boot, and

means on said ski boot for automatic engagement with said safety ski binding as the boot heel end is moved toward the ski blade to fit the boot into the binding, said means



comprising a recess formed at the boot heel end between the sole and the upper and dimensioned to permit the introduction of said lever free end into said recess and an extension of the upper rearwardly beyond the heel end of the sole so that as the boot heel end is moved toward the ski to fit the boot into the binding, said lever free end in said open position engages the boot upper which on continued relative movement of the boot automatically pivots the lever to said closed position causing said lever free end to move into said recess for cooperative retention of the boot on the ski blade, and said recess of the ski boot being bounded by substantially parallel, confrontingly spaced apart surfaces of the sole and upper of the boot.

4,330,139

SAFETY MEANS FOR AUTOMOBILE STEERING MECHANISMS

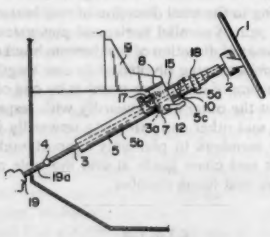
Kazuo Katayama, Hiroshima, Japan, assignor to Toyo Kogyo Co., Ltd., Hiroshima, Japan

Filed Jun. 24, 1980, Ser. No. 162,442

Claims priority, application Japan, Jun. 27, 1979, 54-89039[U]

Int. Cl.³ B62D *1/18*

U.S. Cl. 280—777 **8 Claims**



1. An automobile steering mechanism comprising steering shaft means, steering column means for rotatably supporting said steering shaft means, steering bracket means provided on an automobile body for supporting said steering column means, spring means for urging said steering column means against said steering bracket so that said steering column means is frictionally held on said steering bracket means, releasable constraining means for normally holding the spring means in an operative position wherein said spring means applies its influence on said steering column means so that said steering column means is urged against the steering bracket means, means responsive to a crashing deformation of the automobile body for releasing the constraining means so that the steering column means is relieved of the influence of the spring means to thereby release the steering column means from the bracket means.

4,330,140

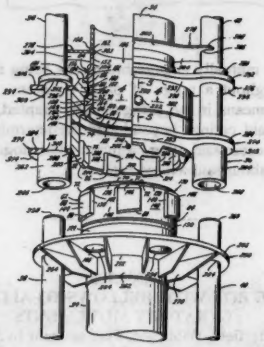
MARINE RISER CONNECTOR

J. E. Hampton, Dallas, Tex., assignor to Smith International, Inc., Newport Beach, Calif.

Continuation of Ser. No. 793,778, Apr. 1, 1977. This application Dec. 17, 1980, Ser. No. 217,337

Int. Cl.³ F16L *35/00*

U.S. Cl. 285—39 **27 Claims**



1. A connector joint for use with underwater risers, including choke and kill line pipe sections and a first and a second drill string pipe section, to connect a wellhead on the ocean bottom to a floating drilling rig, comprising:

a male member having means for connection to such first pipe section, said male member having a shoulder;

a female member having means for connection to such second pipe section, said female member having a shoulder and an opening for telescopically receiving said male member until said male shoulder contacts said female shoulder; and

compressive means for urging said shoulders together under compressive load for holding said male and female members in compression, said compressive means held in tension while said shoulders are held in compression, and said compressive means including -

a rotatable nut, and

means for supporting such choke and kill line sections while permitting rotation of said nut.

4,330,141

ADJUSTABLE PIPE UNION

Gary A. Kohn, Dallas, Tex., assignor to Otis Engineering Corporation, Dallas, Tex.

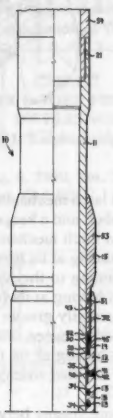
Filed Mar. 3, 1980, Ser. No. 126,689

Int. Cl.³ F16L *15/02*

U.S. Cl. 285—93 **9 Claims**

1. An adjustable pipe union comprising: an outer tubular mandrel having a first internally threaded end portion provided with an internal annular stop shoulder facing said first end portion at the inward end of the threads provided along said end portion, an intermediate bore portion smaller than the bore along said first end portion, internal annular packing recess means in said mandrel around said intermediate bore portion between said stop shoulder and said second end of said mandrel, packing means in said packing recess means for seal-

ing between said outer mandrel and an inner mandrel therein, and internal annular longitudinal threads formed in said outer mandrel along said intermediate bore portion between said packing recess means and said second end of said mandrel, a second opposite end portion of said outer mandrel having a bore portion smaller than said intermediate bore portion of said outer mandrel and provided with longitudinal threads for connecting said second end portion of said outer mandrel with an adjacent tubular member; an inner tubular mandrel sized to telescope into said outer mandrel through said first and said intermediate bore portions of said outer mandrel, said inner mandrel having a first end portion provided with threads engageable with said longitudinal threads along said intermediate portion of said outer mandrel, said threads along said inner mandrel first end portion and said mandrel intermediate portion permitting said inner mandrel to rotate in said outer mandrel for rotational and longitudinal adjustment of said inner



mandrel in said outer mandrel, and said inner mandrel having a second opposite end portion provided with threads for connection of said second end portion of said inner mandrel with an adjacent tubular member; annular lock means within said first internally threaded end portion of said outer mandrel around said inner mandrel on said stop shoulder within said outer mandrel; and a tubular jam nut having an externally threaded end portion engaged in said threads along said first end portion of said outer mandrel, said jam nut having an end edge engageable with said annular lock means for expanding lock means to provide a lock between said inner and outer mandrels, and said jam nut having an enlarged second end portion extending along said inner mandrel from said first end portion of said outer mandrel providing a surface portion of said nut for engagement of a tool for rotation of said jam nut whereby said jam nut may be threaded into said first end portion of said outer mandrel against said annular lock means.

4,330,142

FORMED HOSE COUPLINGS

William R. Paini, Fayette, Ohio, assignor to Fayette Tubular Products, Fayette, Ohio

Filed Jan. 10, 1980, Ser. No. 111,118
Int. Cl.³ F16L *33/20*
U.S. Cl. 285—256 **11 Claims**

1. A serviceable-type hose coupling for a tube comprising:

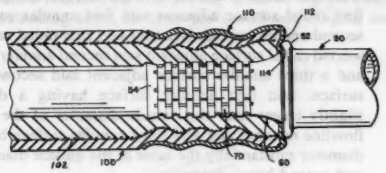
(A) a tubular nipple end on the tube over which a section of said hose snugly fits, said nipple having:

(a) a plurality of parallel segmented circumferential alternate larger and smaller diameter portions, said portions having connecting walls diverging outwardly at an angle between about 50° and 70° from said smaller diameter portions,

(b) a plurality of at least three equally angularly spaced axially extending rows of outward projections, at least one projection extending from each of said larger diameter portions,

(c) and a radially outwardly extending circumferential flange bead at the inner end of said nipple,

(B) a compressible hose snugly fitting over said nipple and against said bead, and



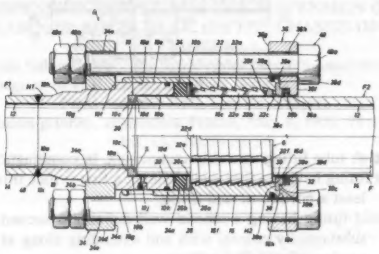
(C) a ferrule fitting over said hose and having a radial end flange against the end of said hose and abutting against said bead of said nipple, said ferrule being radially inwardly compressed around said hose to urge said hose against said larger and smaller diameter portions of said nipple and to urge said hose axially against the inside of said flange of said ferrule which in turn is urged against said bead to form a seal to protect the end of said hose.

4,330,143

APPARATUS FOR CONNECTING TOGETHER FLOWLINE END PORTIONS

Bobby J. Reneau, P.O. Box 11625, Houston, Tex. 77016

Filed Dec. 3, 1979, Ser. No. 99,756
Int. Cl.³ F16L *21/06*
U.S. Cl. 285—322 **7 Claims**



1. An apparatus for connecting first and second flowline members for fluid flow therethrough, comprising:

a first housing member adapted to be mounted with the first flowline member, said first housing member having a first bore and a second bore formed therein, said first bore being of an inside diameter substantially the same as the inside diameter of the second flowline member, said second bore being of an inside diameter substantially the same as the outside diameter of the second flowline member, said first housing member having a radial lip formed adjacent said first and second bores;

a seal ring for sealably engaging the butt end surface of the second flowline member for effecting a fluid-tight relation therebetween, said seal ring mounted in said first housing member adjacent said radial lip;

a second housing member mounted for axial movement with respect to said first housing member;

gripping means with said second housing member for moving radially inwardly into gripping engagement with the second flowline member upon axial movement of said second housing member relative to said first housing member;

a first flange mounted for movement about said first housing member;

a second flange mounted for movement adjacent an outer end of said second housing member;

moving means for axially moving said first flange towards said second flange, said moving means mounted with said first and second flanges; and,

said second flange is formed having a first annular surface, a first radial surface adjacent said first annular surface, a second annular surface adjacent said first radial surface, a second radial surface adjacent said second annular surface and a third annular surface adjacent said second radial surface, said first annular surface having a diameter slightly larger than the outside diameter of the second flowline member and said third annular surface having a diameter substantially the same as the outside diameter of said second housing member.

4,330,144

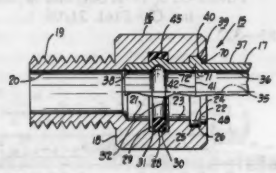
TUBE FITTING ASSEMBLY WITH DEFORMABLE SEAL

Ralph G. Ridenour, 626 Lexington-Ontario Rd., Mansfield, Ohio 44903

Continuation-in-part of Ser. No. 527,683, Nov. 27, 1974, Pat. No. 4,200,314, which is a division of Ser. No. 425,561, Nov. 17, 1973, abandoned. This application Jun. 19, 1978, Ser. No. 916,738

Int. Cl.³ F16L *13/14*

U.S. Cl. 285—382.5 **4 Claims**



1. A tube fitting assembly comprising, in combination:

a fitting having a first wall defining a first orifice through at least a portion of said fitting;

said fitting having a second wall defining a second orifice substantially coaxial with and extending along at least a portion of said first orifice;

said second orifice having a greater cross-sectional area than said first orifice;

a tube having an inner and an outer tube wall with a first portion of said outer tube wall having an outer cross-sectional area substantially equal to said first orifice and being disposed in said first orifice;

retention means longitudinally retaining said tube within said fitting and including a second portion of said tube longitudinally compressed to have two annular parts of said inner tube wall in mutual engagement to establish a radially expanded bead portion of the outer tube wall acting against and being radially restrained by said second wall of said fitting;

an annular deformable seal member separate from each of said tube and said fitting in sealing engagement between an outer surface of said tube and an inner surface of said fitting;

said annular deformable seal member being an O-ring disposed in an annular groove in said fitting and engaging said outer wall of said tube, and

said tube having a second radially expanded portion in engagement with said O-ring.

4,330,145

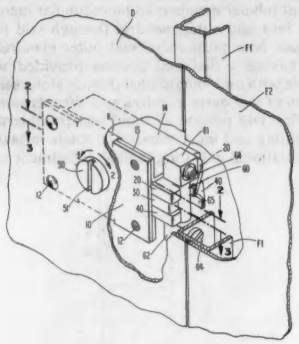
DOUBLE-LATCH MECHANISM

Robert H. Bisbing, Springfield, Pa., assignor to Southco, Inc., Concordville, Pa.

Filed Aug. 5, 1980, Ser. No. 175,485

Int. Cl.³ E05C *1/16*

U.S. Cl. 292—37 **6 Claims**



1. In combination; a latch mechanism adapted to be mounted on a door or like member, and a keeper adapted to be mounted on the door jamb, said latch mechanism comprising:

a. a primary pawl having at its forward end a recess having a width corresponding to the width of said keeper;

b. a secondary pawl having at its forward end a recess having a width substantially greater than that of said keeper;

c. a lever sandwiched between said primary and secondary pawls, said lever having at its forward end a forwardly projecting finger adapted to engage the outer surface of said keeper;

d. compression spring means between said lever and said door for urging said door outwardly relative to said lever;

e. spring means biasing said primary pawl forwardly toward said keeper, whereby said keeper is received in said recess of said primary pawl, thereby to prevent outward movement of said door;

f. spring means biasing said secondary pawl forwardly toward said keeper, whereby said keeper is received in said wide recess of said secondary pawl, whereby said secondary pawl is free to move relative to said keeper unless prevented by said primary pawl;

g. cam means mounted on said door in such position as to be adapted for engagement with both said primary and secondary pawls;

h. means for rotating said cam means in one direction for retracting said primary pawl, whereby said keeper clears said recess of said primary pawl; thereby to allow said lever to move said door outwardly to a first limit position;

i. means for rotating said cam means in the opposite direction for retracting said secondary pawl, whereby said keeper clears said wide recess of said secondary pawl, thereby to allow full opening of said door.

4,330,146

PORTABLE DOOR LOCK

E. Reed Sessions, Jr., P.O. Box 7778, Macon, Ga. 31204

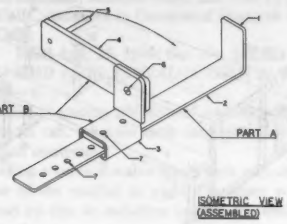
Filed Jan. 2, 1980, Ser. No. 109,093

Int. Cl.³ E05C *19/18*

U.S. Cl. 292—258 **2 Claims**

1. A portable door lock comprised of an L-shaped bar which goes under and inside a door on the latch side and has a bracket which slides onto it for movement to the thickness of the door jam, means to receive the padlock to lock said bracket in position on said bar, and an arm pivoted on said bracket having a part extending therefrom so that when the bracket is moved

the part on the pivoting arm can be inserted into a small hole in the door jam facing or adjacent wall, and a padlock can be



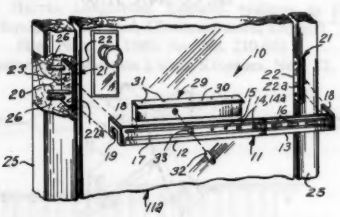
affixed to the bracket and bar so that it is rigidly secured inside and out regardless of which side of the door the hinge is on.

4,330,147

LOCKING BAR FOR DOORS FROM THE INSIDE OF DWELLINGS

Herbert J. Nolen, 6151 Knightsbridge Dr., Memphis, Tenn. 38115

Filed Aug. 6, 1980, Ser. No. 175,913
Int. Cl.³ E05C *17/54*
U.S. Cl. 292—259 R **4 Claims**



1. A locking bar for doors, comprising, in combination, a pair of adjustable rails, a pair of latching brackets received in the door jambs, between which a door is supported for latching and holding said pair of adjustable rails against forceful pressure against the outside of said door, and a bar removably received between said pair of adjustable rails and said door for rendering said pair of adjustable rails secure in their latching engagement with said pair of latching brackets.

4,330,148

ADJUSTABLE SUN VISOR EXTENDER

Romanus M. LaMont, Box F3, Wickenburg, Ariz. 85358

Filed Jun. 9, 1980, Ser. No. 157,781
Int. Cl.³ B60J *3/00*
U.S. Cl. 296—97 C **8 Claims**

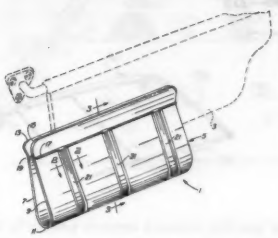
1. A sun visor extender comprising in combination:

a. first and second panels each having first and second opposed edges, each of said first and second panels having an outer surface and also having an inner pressure surface located adjacent to said second edge thereof, said first and second panels each being of substantially the same size;

b. hinging means attached to said first edge of each of said first and second panels and integral with and extending between said first and second panels for hingably connecting said first and second panels together, said hinging means maintaining said first and second edges a predetermined distance apart;

c. a plurality of removable spring clips disposed along the outer surfaces of said first and second panels and said hinging means for urging said first and second pressure surfaces, respectively, against opposed outer surfaces of an automobile's sun visor; and

d. retaining means for preventing sliding of said spring clips along said outer surfaces of said first and second panels, each of said spring clips including a U-shaped spring metal member having two leg portions which extend along said outer surfaces of said first and second panels, respectively, and a rounded portion joining said two leg portions and extending along an outer surface of said hinging means,



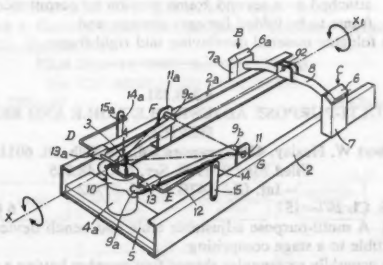
each of said leg portions having an inwardly oriented end portion disposed on the free end thereof for engaging said retaining means, each of said U-shaped spring metal members being removable from said sun visor by merely spreading the free ends of the two leg portions of that U-shaped spring metal member apart and away from said retaining means, said first and second panels being composed of plastic, said spring clips being composed of elastic, relatively temperature-insensitive metal.

4,330,149

SUSPENSION DEVICE, FOR THE SUSPENSION OF A CABIN IN PARTICULAR, ON THE CHASSIS OF A VEHICLE

Claude Salmon, Marly le Roi, France, Société Anonyme dite: assignor to UNIC S.A., Trappes, France

Filed Apr. 25, 1980, Ser. No. 143,401
Claims priority, application France, May 9, 1979, 79 11774
Int. Cl.³ B62D *33/06*
U.S. Cl. 296—190 **9 Claims**



1. A three point suspension device for suspending a cabin on a vehicle chassis comprising a first elastic connection assembly interposed between said chassis and said cabin at a central position adjacent the front portions of said chassis and cabin, said elastic connection assembly having a resonant frequency in the range of from about 1 to about 3 Hz, second and third connections interposed between said cabin and chassis, said second and third connections being disposed at a position rearwardly spaced from said first connection and being laterally spaced symmetrically to opposite sides of the longitudinal rolling axis of said cabin, and an anti-roll torsion bar assembly interposed between said chassis and cabin and positioned to

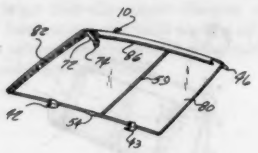
restrain relative rotation of said cabin with respect to said chassis about said rolling axis.

4,330,150

REMOVABLE ROOF PANEL FOR VEHICLES

Richard S. Dunchock, 27545 Gateway Dr., Farmington Hills, Mich. 48018, and Sam M. Alagna, 5391 Folkstone, Troy, Mich. 48098

Filed May 19, 1980, Ser. No. 150,934
Int. Cl.³ B60J 7/10
U.S. Cl. 296—218 **4 Claims**



1. A removable panel for motor vehicles of the type having a windshield and a rigid roof portion including an access opening with first and second marginal edges spaced rearwardly from the windshield and extending inwardly from the side of said roof portion, a third marginal edge connecting the inward end of said first and second marginal edges to define the opening, said roof panel comprising:

a rigid folding frame having marginal edges complimentary to the opening contoured to overlie and engage said access opening marginal edges;

said folding frame defining the marginal edges of the panel and stretching said panel in a longitudinal and transverse direction;

a first of said frame marginal edges being adapted to overlie said first marginal edge of said access opening and having means disposed at the interface of said body portion first marginal edge and said access opening first marginal edge for releaseably securing and sealing said interfaced edges to prevent the passage of air thereby;

means carried by a second and third marginal edge of said body portion for releaseably engaging respectively said second and third access opening marginal edges, said rigid frame being comprised of a first frame portion hingedly attached to a second frame portion to permit said rigid frame to be folded for easy storage; and

a foldable material overlaying said rigid frame.

4,330,151

MULTI-PURPOSE ADJUSTABLE TABLE AND BENCH DEVICE

Robert W. Healey, 420 Sycamore Rd., DeKalb, Ill. 60115

Filed May 9, 1980, Ser. No. 148,545
Int. Cl.³ A47B 39/00, 83/02
U.S. Cl. 297—157 **6 Claims**

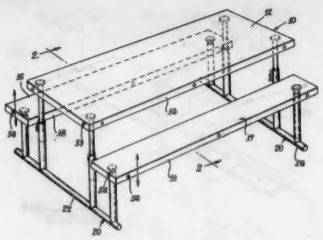
1. A multi-purpose adjustable table and bench device convertible to a stage comprising:

a generally rectangular shaped first member having a generally flat top planar surface;

a pair of generally rectangular shaped second members each having a generally flat top planar surface;

supporting means for supporting the first member and the pair of second members wherein the generally flat top planar surface of the first member is generally horizontally disposed a predetermined distance above the ground, and the generally flat planar surfaces of each of the second members are each horizontally disposed a predetermined distance above the ground, and the pair of second members are disposed on opposite sides of the first member in a parallel array;

adjusting means for adjusting the relative distance between the planar surfaces of each of the pair of second members and the planar surface of the first member; and



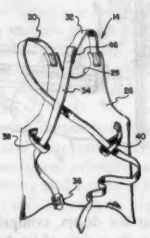
first securing means for securely attaching the table and bench device to one or more similar table and bench devices.

4,330,152

SUPPORT AND RESTRAINT APRON

Sandra K. Legan, 335 Bard St., Fillmore, Calif. 93015, and Delores M. Diehl, 500 W. Santa Maria, Santa Paula, Calif. 93060

Filed Aug. 4, 1980, Ser. No. 174,742
Int. Cl.³ A47C 31/00
U.S. Cl. 297—465 **6 Claims**



2. In combination with a chair, a person to occupy the chair, a support and restraint apron for the person comprising:

a sheet material body section to be positioned against the chest area of the person, said sheet material body section having an exterior surface and an interior surface, said interior surface to be located directly against the person, said body section having an upper edge, and a right edge and a left edge;

a first strap attached to said upper edge and adapted to be located directly adjacent one side of the neck of the person, a second strap attached to said upper edge and adapted to be located directly adjacent the other side of the neck of the person, said first and second straps to be located in a crossed relationship about the back of said chair;

a first loop attached to said interior surface adjacent said right edge, a second loop attached to said interior surface adjacent said left edge, both said first and second loops being located in the waist area of the person, said first strap to pass through said second loop and said second strap to pass through said first loop;

attaching means securing together the free ends of said first and second straps; and

quick release means connected to said first strap and separate from said attaching means, whereby operation of said quick release means disengages said apron from said chair permitting said person to be then removed from said chair.

4,330,153
IDENTIFICATION OF FLUID FLOW UNDER IN-SITU MINING CONDITIONS

Peter M. Di Giacomo, Mission Viejo, and Won C. Park, Irvine, both of Calif., assignors to Occidental Research Corporation, Irvine, Calif.

Filed Aug. 29, 1980, Ser. No. 182,522
Int. Cl.³ E21B *43/28;* E21C *41/14;* G01N *31/22, 33/24*
U.S. Cl. 299—1 **27 Claims**

1. A method of tracing the flow of a solution for extracting values from an ore, wherein such extraction leaves behind a residue which comprises:

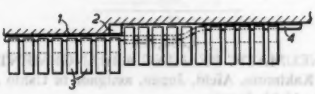
(a) providing a surface-active dye which may adsorb on the surface of the residue to yield a product which can be detected by eye or radiation outside the visible range of light, and

(b) detecting said product.

4,330,154
MINING APPARATUS

Robert G. Harris, Longlevens, England, assignor to Dowty Mining Equipment Limited, Gloucestershire, England

Filed Nov. 24, 1980, Ser. No. 210,001
Claims priority, application United Kingdom, Nov. 22, 1979, 7940390
Int. Cl.³ E21D *23/14*
U.S. Cl. 299—1 **3 Claims**



1. For use in a mining apparatus including a cutting machine and a plurality of roof supports, each having an advance-initiating means responsive to a command signal for controlling the advance of the roof support, arranged side-by-side along a mineral face to be cut by the machine, a control means comprising:

(a) a radiation-emitting device associated with the cutting machine,

(b) a plurality of receiving devices, one associated with each roof support, capable of receiving radiation emitted from the radiation-emitting device as the cutting machine passes in proximity to a receiving device and capable of generating a main electrical control signal in response to the receipt of such radiation,

(c) a main control conductor connected to the receiving devices for carrying a main electrical control signal,

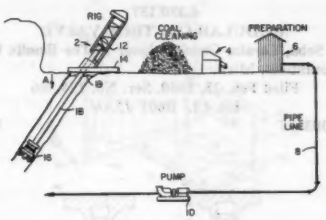
(d) disabling means associated with each advance-initiating means and with the main control conductor for rendering an advance-initiating means non-responsive to a command signal applied to the advance-initiating means when the main electrical control signal is above a pre-determined value, and

(e) attenuating means associated with the main control conductor between each pair of roof supports for attenuating the main electrical control signal to a value below the said pre-determined value when that signal has passed a pre-determined number of attenuating means from a receiving device receiving radiation from the radiation-emitting device.

4,330,155
BORE HOLE MINING

Paul Richardson, Santa Ana, and David A. Whitley, Brea, both of Calif., assignors to Santa Fe International Corporation, Orange, Calif.

Filed Mar. 26, 1980, Ser. No. 134,296
Int. Cl.³ E21D *1/06*
U.S. Cl. 299—11 **39 Claims**



1. A method of mining mineral deposits utilizing large shaft diameter drilling equipment arranged on the surface of the earth, the method comprising the steps of:

(a) drilling down into the earth with a drilling member for forming a large diameter hole so as to break up mineral deposits as the drilling occurs and during such drilling operation maintaining a working fluid in the drilled hole;

(b) removing broken mineral fragments from the drilled hole;

(c) decreasing the level of fluid in the drilled hole so as to decrease the hydrostatic pressure created by the fluid against the side walls of the hole for intentionally inducing creep in portions of the side walls of the drilled hole during the drilling operation for causing substantial portions of such side walls to fall into the drilled hole;

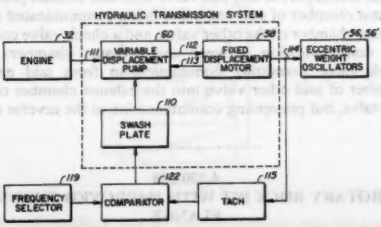
(d) retracting the drilling member from the drilled hole and simultaneously drilling out any mineral fragments from the side walls that have fallen into the hole above the drilling member; and,

(e) removing such mineral fragments as the drilling member is retracted from the drilled hole.

4,330,156
RESONANT SYSTEM SPEED CONTROL

Raymond A. Gurries, Reno, Nev., assignor to Resonant Technology Co., Sparks, Nev.

Filed Mar. 14, 1980, Ser. No. 130,508
Int. Cl.³ A01B *35/00;* E01C *23/09*
U.S. Cl. 299—37 **13 Claims**



1. Resonant work performing apparatus comprising:

a resonant system having a vibratory input, an output vibratory in first and second opposite directions responsive to vibrations at the input, and at least one intermediate node;

a frame attached to the resonant system substantially at the node;

means for applying a vibrational force to the input of the

resonant system at a given frequency near the unloaded resonant frequency to excite the resonant system to at least near resonance;

means for sensing the frequency of the resonant system; and

means responsive to said sensing means for controlling the applying means to hold the applied vibrational force at the given frequency to prevent movement of the node positions.

4,330,157

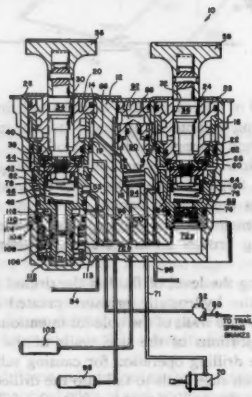
MODULAR CONTROL VALVE

Milan J. Sebo, Lorain, Ohio, assignor to The Bendix Corporation, Southfield, Mich.

Filed Feb. 25, 1980, Ser. No. 124,386

Int. Cl.³ B60T *15/04*

U.S. Cl. 303—7 **8 Claims**



1. In a fluid pressure braking system for a vehicle having a fluid pressure source, and first and second sets of parking brakes, control mechanism comprising a pair of valves, each of said valves being operable to communicate a pressure signal from said source to a corresponding set of said parking brakes to effect release of said parking brakes and having an inlet port communicated with said pressure source, an outlet port communicated to a corresponding one of said sets of parking brakes, an exhaust chamber, a valve plunger for controlling communication between said ports and the exhaust chamber, the exhaust chamber of each of said valves being communicated to a common exhaust port, the valve plunger of one of said valves being responsive to the pressure in the exhaust chamber of the other valve to move to a position communicating the outlet port of said one valve with said exhaust port, said exhaust chamber of said one valve being communicated to the exhaust chamber of the other valve, and a check valve controlling communication between said exhaust chambers, said check valve permitting communication from said exhaust chamber of said other valve into the exhaust chamber of said one valve, but preventing communication in the reverse direction.

4,330,158

ROTARY ROCK BIT WITH IMPROVED THRUST FLANGE

D. F. Walters, Dallas, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Oct. 9, 1980, Ser. No. 195,469

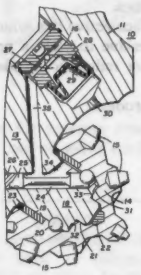
Int. Cl.³ F16C *33/10*; E21B *9/08*

U.S. Cl. 308—8.2 **4 Claims**

1. In an improved earth boring bit having a bit body providing a cutter arm with a bearing pin extending downwardly therefrom and defining a rolling axis and a rolling cone cutter rotatably mounted on said pin, said pin and said cutter respectively defining radially extending annular facing surfaces and said bit having a lubricant distribution system for delivering lubricant to said surfaces wherein said improvement comprises:

said annular surface of said cutter defining a first thrust bearing surface;

said annular surface of said pin providing an axially open annular groove with a plurality of arcuate segments of



said groove filled with a hardmetal material to define thereby separate arcuate segments providing a hardmetal bearing surface separated by separate arcuate segments defining voids or pockets therebetween; and

wherein said voids provide circumferential openings between said arcuate portions providing lubricant reservoirs for the ingress of lubricant to the thrust bearing surfaces during rotation of said cone to replenish lubricant therebetween, said voids further providing debris traps for the wear debris and contaminant particles.

4,330,159

PNEUMATIC BEARING ARRANGEMENT

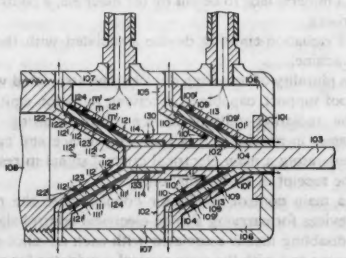
Masakazu Kakimoto, Aichi, Japan, assignor to Ushio Air Tool Co., Ltd., Aichi, Japan

Filed Oct. 3, 1980, Ser. No. 193,440

Claims priority, application Japan, Feb. 17, 1979, 54-17713

Int. Cl.³ F16C *32/06*

U.S. Cl. 308—9 **37 Claims**



1. A pneumatic bearing arrangement comprising:

(a) an outer element have a generally conical configuration and a concave bearing surface;

(b) an inner element having a generally conical configuration and a convex bearing surface, said elements disposed in generally concentric relation and defining a generally conical bearing space therebetween;

(c) a plurality of nozzles on each of said elements, said nozzles opening adjacent to said bearing surfaces; and

(d) a shaft having a generally conical journal member with

an inner and an outer face, said shaft and journal member having a substantially Y-shaped cross sectional configuration, whereby said journal member is rotatably supported by said bearing space such that gaps exist both between said outer face and said concave bearing surface and between said inner face and said convex bearing surface, whereby when air is jetted into said bearing space through said nozzles air films maintain the journal floating between said bearing surfaces without contacting said bearing surfaces, said air film maintaining said journal member in a balanced, contactless, position even during the application of both thrust and radial loads.

4,330,160

BEARING CAGE, IN PARTICULAR FOR TWO-ROW ANGULAR CONTACT BALL BEARINGS

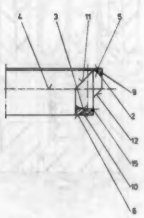
Robert Stolz, and Günter Neder, both of Schweinfurt, Fed. Rep. of Germany, assignors to SKF Kugellagerfabriken GmbH, Schweinfurt, Fed. Rep. of Germany

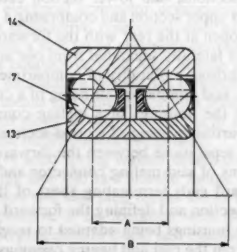
Filed Mar. 13, 1980, Ser. No. 130,137

Claims priority, application Fed. Rep. of Germany, Mar. 17, 1979, 7907497[U]

Int. Cl.[3] F16C *19/20, 33/38*

U.S. Cl. 308—201 4 Claims





1. In a bearing cage having two rings connected by webs for angular contact two-row ball bearings including bearing cage ring having cage pockets of a partial spherical shape, the combination comprising the radial plane of the bearing passing through the centers of said partial spheres and placed off-center with respect to the bearing cage ring faces, the distance between the radial plane and the face less distant from the radial plane being preferably equal to the radius of the ball, wherein said cage ring is further defined as a set of axially retractable dies having cage pockets formed therein, and wherein the edge formed by the parting of the axially retractable dies serving to form the cage pockets is placed outside the pitch circle.

4,330,161

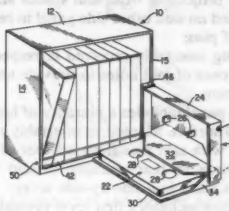
STORAGE UNIT FOR TAPE CASSETTES

Antoine B. Khawand, 170 West End Ave., New York, N.Y. 10023

Filed Aug. 6, 1979, Ser. No. 64,187

Int. Cl.[3] A47B *81/06, 96/06*

U.S. Cl. 312—9 9 Claims



1. A storage system comprising at least one box of the type for holding cassettes and the like having a bottom section and a cover which is hinged to said bottom section to permit movement of the cover relative thereto,

a housing,

at least one holding means including an arm formed by a solid piece of material which extends for substantially the entire length of the bottom section of said box,

means for detachably coupling said arm to said bottom section of a said box,

and means including hinge means for attaching said holding means to said housing to permit pivoting of said arm of said holding means and the box fastened thereto only inwardly and outwardly of said housing,

said holding means and said attaching means permitting the cover of the cassette box to be opened and closed relative to the bottom section of the cassette box when the cassette box is extended from the housing and coupled thereto by said holding means and said attaching means.

4,330,162

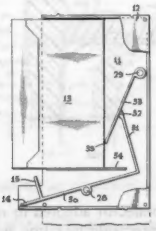
TAPE CARTRIDGE STORAGE DEVICE

Michel F. Aboussouan, 8135 Clybourn Ave., Sun Valley, Calif. 91352

Filed Mar. 4, 1980, Ser. No. 127,133

Int. Cl.[3] A47B *81/06*

U.S. Cl. 312—15 4 Claims



1. A tape cartridge storage apparatus comprising the combination of:

a holder having upper and lower sections joined by a rear section separating a pair of side panels to define an internal storage cavity for slidably receiving a tape cartridge via an open entrance between said side panels at one end thereof;

lever means operably carried on pivots between said side panels adapted to be manually depressed for forciably

urging said tape cartridge out of said storage cavity via said entrance;

said one side panel being fixed to said upper and lower sections and the other side panel detachably secured to the side of said upper and lower sections opposite to its side fixed to said one side panel;

detachable means for securing said other side panel to said upper and lower sections which include a plurality of pins outwardly projecting from said spacer and a plurality of holes carried on said other side panel in registry with said plurality of pins;

said pins being insertably received in respective associated registered ones of said holes to provide an interference fit therebetween;

said one side panel includes a plurality of holes provided on its external surface adapted to insertably receive an interference fit with said pins from another of said upper and lower sections to that plurality of said holders are arranged in a stack in a side-by-side array;

said lever means includes a first lever pivotably carried at its mid-section on the inner surface of said one side panel having a finger depressing end exposed exteriorly of said holder and its opposite end provided with a rear upright element projecting into said storage cavity; and

a second lever pivotably carried on one of its ends on the inner surface of said rear section having its med-section engagable by the end of said rear upright element of said first lever and the terminating opposite end of said second lever adapted to engage with said tape cartridge in response to said aforementioned first and second lever engagement; and

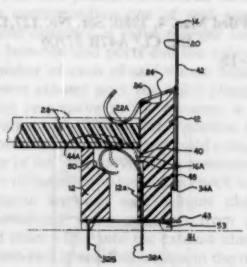
said first lever having a front stop member projecting upwardly at the entrance to said internal storage cavity interferring with withdrawal of said tape cartridge from said cavity.

4,330,163

ZERO INSERTION FORCE CONNECTOR FOR LSI CIRCUIT PACKAGE

Paul W. Aikens, Mechanicsburg, and Frank J. Wilding, New Cumberland, both of Pa., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Dec. 5, 1979, Ser. No. 100,521
Int. Cl.³ H01R *9/09*
U.S. Cl. 339—17 CF **11 Claims**



1. An electrical connector adapted to receive a LSI circuit package without appreciable insertion force, said connector comprising

a. a dielectric housing section having a plurality of cavities each adapted to receive a contact spring, said housing having an outside and an inside wall, each said contact spring having a first contact surface projecting towards the top of said housing for contact with a contact pad of a LSI circuit package and a second contact surface projecting from said housing in another direction for contact with another electrical device, the top of said housing having a shelf with a longitudinally extending valley, said valley defined by a ramp on each side, the ramp closest to the inside wall of said housing having a lip on its upper edge; and

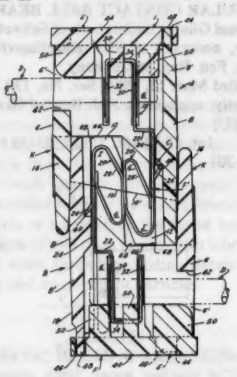
b. a captive clamping member movably attached to the outside wall of each said housing section, said clamping member having a rib movably attached to the outside wall of said housing section, and a latching member movable in the valley, said latching member in the retracted position being retained between the ramps in the valley and being transversely movable over the lip to clamp the LSI circuit package to the housing.

4,330,164

HERMAPHRODITE ELECTRICAL CONNECTOR

Robert B. Pittman, River Edge; Ronald O. Wescott, Edison, both of N.J., and Michael Offerman, Merrick, N.Y., assignors to Industrial Electronic Hardware Corp., New York, N.Y.

Continuation of Ser. No. 49,273, Jun. 18, 1979, abandoned. This application Sep. 29, 1980, Ser. No. 191,377
Int. Cl.³ H01R *23/20*
U.S. Cl. 339—49 R **33 Claims**



1. An hermaphrodite electrical connector part adapted to mate with a similar connector part comprising a body having upper and lower sections, said lower section extending forwardly beyond said upper section and comprising a plurality of terminal housings open at the rear with the forwardly extending portions thereof laterally separated from one another, said upper section comprising a plurality of compartments defined between partitions, said compartments being of a cross-section such as to receive the housings of a mating connector part therewithin, said partitions being of a cross-section such as to be received in the separations between the forwardly extending housing portions of said mating connector and said partitions having forward ends terminating short of the forward end of said lower section and defining the forward end of said upper section, said housings being adapted to receive contact terminals therein from the rear and having openings in the tops thereof to which said terminals are adapted to extend.

4,330,165

PRESS-CONTACT TYPE INTERCONNECTORS

Ryoichi Sado, Saitama, Japan, assignor to Shin-Etsu Polymer Co., Ltd., Tokyo, Japan

Filed Jun. 18, 1980, Ser. No. 160,729
Claims priority, application Japan, Jun. 29, 1979, 54-89164[U]
Int. Cl.³ H01R *13/48*
U.S. Cl. 339—59 M **2 Claims**

1. An interconnector of press-contact type which comprises (a) a rod member made of an electrically insulating rubbery elastomer having two opposite surfaces longitudinally extending substantially in parallel with each other,

(b) a plurality of linear bodies of an electrically conductive material embedded in the rod member as distributed over substantially whole length of the rod member and as oriented in such a manner that the ends of each of the linear bodies appear on the opposite surfaces of the rod member, and

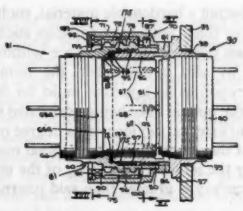
(c) at least one sheet member of an electrically insulating, flexible material having higher rigidity than the electrically insulating rubbery elastomer of the rod member and embedded within or bonded to the surface of the rod member as extending in the direction in parallel to the longitudinal direction of the rod member in such a disposition that the sheet member is bent or curved as viewed in the longitudinal direction of the rod member.

4,330,166

ELECTRICAL CONNECTOR SUBSTANTIALLY SHIELDED AGAINST EMP AND EMI ENERGY

Earl A. Cooper, Venice, and Bennett L. Hallenbeck, Santa Monica, both of Calif., assignors to Automation Industries, Inc., Greenwich, Conn.

Filed Aug. 16, 1979, Ser. No. 67,196
Int. Cl.³ H01R *13/648*
U.S. Cl. 339—143 R **9 Claims**



5. In an electrical connector comprising receptacle means including a conductive receptacle shell having an edge face and enclosing a first set of electrical contacts, and plug means including a conductive plug shell having an internal annular flange and enclosing a second set of electrical contacts, said receptacle means and said plug means being movable relative to each other along an axis into and out of mated and unmated positions, the improvement comprising:

conductive solid spring washer means compressed between said edge face and said annular flange when said receptacle means and said plug means are in the mated position, and operative in co-operation with said receptacle shell and said plug shell to shield said electrical contacts against electromagnetic pulse energy.

4,330,167

FUSED ELECTRIC PLUG

Chen Chien-Tung, 7, Lane 1230, Kuang Fu Rd., Hsin Chu City, Taiwan

Filed Dec. 18, 1979, Ser. No. 104,815
Int. Cl.³ H01R *13/68*
U.S. Cl. 339—147 P **11 Claims**

1. A fused electric plug comprising a cover, a housing assembly and at least two fuse elements, said housing assembly having two elongate, unitary conductive plates, each plate including a planar portion extending out of said housing assembly and a U-like portion housed in said housing; said U-like portion including first and second leg elements extending longitudinally of said plate and joined at one end of each of said leg elements to one end of said planar portion, said first and second leg elements extending beside each other, and a third leg element which is joined at one end thereof to another end of said second leg element and which extends from said second leg element at an angle thereto; two conductive terminals each

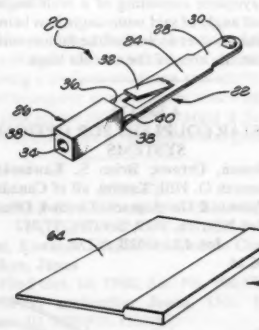
connected with a conductor and located adjacent one of said U-like portions, respectively; each of said fuse elements being interposed directly between one side of said U-like portion and one terminal respectively, said cover and said housing assembly being fixed together so that each of said fuse elements is in electrical contact with an associated U-like portion and terminal.

4,330,168

ELECTRICAL CONTACT AND METHOD OF MAKING SAME

Bruce K. Arnold, El Toro, Calif., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Continuation of Ser. No. 52,771, Jun. 28, 1979, abandoned. This application Aug. 18, 1980, Ser. No. 178,986
Int. Cl.³ H01R *11/08*
U.S. Cl. 339—276 T **7 Claims**



1. A method of making an electrical contact comprising the steps of:

providing a sheet of metal having a marginal area along one edge thereof of a thickness greater than the thickness of the remainder of said sheet;

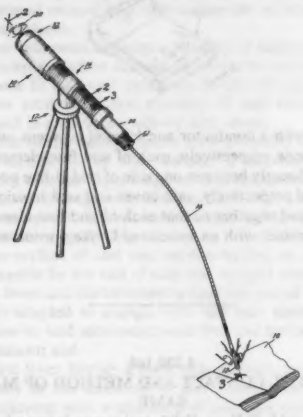
stamping a contact body from said sheet with the longitudinal axis of said body perpendicular to said edge whereby said marginal area provides at one end of said contact body a solid barrel portion of rectangular cross-section and said remainder of said sheet provides at the other end of said contact body a substantially flat portion; and

forming an axial bore in said solid barrel portion to form an integral closed crimp barrel.

4,330,169
DEVICE AND METHOD FOR AIDING VISION

Frederick W. Kantor, 523 W. 112th St., New York, N.Y. 10025

Continuation-in-part of Ser. No. 959,445, Nov. 13, 1978, abandoned, which is a continuation of Ser. No. 816,819, Jul. 18, 1977, abandoned, which is a continuation of Ser. No. 580,351, May 23, 1975, abandoned, which is a continuation of Ser. No. 249,537, May 2, 1972, abandoned. This application Sep. 7, 1979, Ser. No. 73,273
Int. Cl.³ G02B 5/17, 23/00; G02C 7/02
U.S. Cl. 350—9 12 Claims

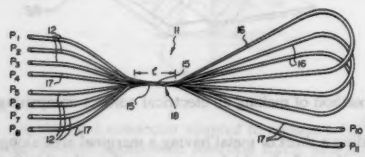


1. A device for aiding in the reading of written matter, said device comprising, in combination, a microscope and flexible light conduit means for transmitting to the object plane of said miscroscope images to be viewed by the person using said device. said microscope producing a substantial magnification and having an eyepiece consisting of a wide-angle lens, said magnification and angle of said wide-angle lens being sufficient to project said images over an area of the human retina substantially greater than the area of the macula lutea.

4,330,170
LOW-LOSS STAR COUPLERS FOR OPTICAL FIBER SYSTEMS

Derwyn C. Johnson, Ottawa; Brian S. Kawasaki, Carleton Place, and Kenneth O. Hill, Kanata, all of Canada, assignors to Canadian Patents & Development Limited, Ottawa, Canada

Filed Nov. 26, 1979, Ser. No. 97,313
Int. Cl.³ G02B 5/172
U.S. Cl. 350—96.16 5 Claims

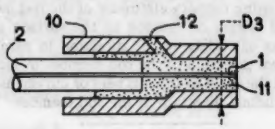


1. A hybrid reflection star coupler comprising: at least one multimode optical fiber having two biconical tapered sections sequentially located along its length and at least one multimode optical fiber having one biconical tapered section along its length, all of the tapered sections of the two biconical section fibers and the one biconical section fibers being fused together along a predetermined length of the tapered sections, with each of the two biconical section fibers being folded back on itself and each of the one biconical section fibers forming an optical path through the coupler.

4,330,171
OPTICAL-FIBER CONNECTOR, CENTERING DEVICE AND METHOD OF MANUFACTURE OF SAID CONNECTOR

Christian Malsot, and Jean-Marie Badoz, both of Suresnes, France, assignors to Socapex, Suresnes, France

Filed Sep. 7, 1979, Ser. No. 73,322
Claims priority, application France, Sep. 12, 1978, 78 26108
Int. Cl.³ G02B 5/14
U.S. Cl. 350—96.21 7 Claims



1. A connector for an optical fiber having an active core for conducting a light signal and a protective jacket surrounding said active core, comprising:

an attachment terminal having a bore therethrough for receiving an end portion of said optical fiber from which a portion of said protective jacket has been stripped, the active core being positioned by a device external to said terminal,

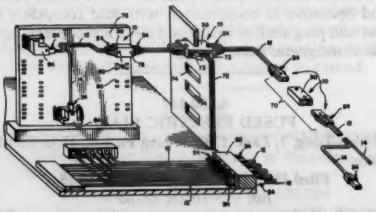
the bore being larger than the outer diameter of said protective jacket,

means for introducing a hardenable material, such as a polymer or adhesive filled with hard particles such as quartz powder or glass powder into the space within said bore not occupied by said optical fiber, the terminal being adapted to function as an injection mold for the hardenable material, the optical fiber being positioned within said terminal by said external device with a degree of accuracy independent of the accuracy of the external machining of the terminal or the internal machining of the bore therein and which accuracy is greater than said internal machining accuracy.

4,330,172
OPTICAL FIBER CONNECTOR HAVING TRANSVERSELY MATEABLE PLUG PORTIONS

Kevin J. Monaghan, Middlebury; Russell C. Schwickert, Newtown, and John J. Esposito, Bethel, all of Conn., assignors to Bunker Ramo Corporation, Oak Brook, Ill.

Continuation of Ser. No. 933,927, Aug. 15, 1978, abandoned. This application Mar. 24, 1980, Ser. No. 133,530
Int. Cl.³ G02B 5/172
U.S. Cl. 350—96.21 20 Claims



1. A connector for coupling an optical fiber to a fiber optic component comprising:

plug means comprising first and second transversely mateable plug portions for holding said optical fiber therebetween, said first plug portion including a forward end

having a continuous forwardly facing mating surface extending in front of said second plug portion, said optical fiber extending through said forward end of said first plug portion to said continuous forwardly facing mating surface; and

housing means mounting said fiber optic component and including a receptacle for receiving said plug means with said continuous forwardly facing mating surface thereof positioned to optically couple said optical fiber and said fiber optic component.

4,330,173

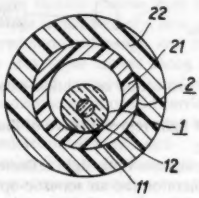
CONDUCTOR FOR OPTICAL CABLES

Ulrich Oestreich, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Continuation of Ser. No. 669,107, Mar. 22, 1976, abandoned. This application Aug. 23, 1979, Ser. No. 68,883

Int. Cl.[2] G02B 5/14

U.S. Cl. 350—96.23 **3 Claims**



1. An improved flexible protective casing for a single longitudinally extending optical fiber for light transmission in an optical cable, comprising an extruded protective casing consisting of two layers of different plastic materials, said protective casing having an inside diameter which is at least 30% larger than the outside diameter of said single fiber, the single fiber being loosely arranged, in air, within said protective casing, said protective casing having:

(a) an inner layer made of one of the group consisting of polystyrene and a fluropolymer, said layer having a small coefficient of friction with respect to said fiber, and

(b) an outer layer made of one of the group consisting of a polyamide, polyterephtalate, polypropylene and polyethylene.

4,330,174

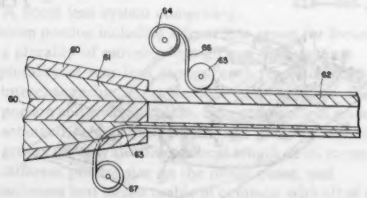
FAIL-SAFE FIBER OPTIC PUSHBUTTONS, DISPLAYS, AND SYSTEMS EMPLOYING THE SAME

Howard S. Douglass, 10053 Aspen La., Windsor, Ontario, Canada (N8R 2B7), and Brian G. Fox, R.R. #1, Dover Centre, Ontario, Canada (N0P 1L0)

Filed Mar. 20, 1980, Ser. No. 132,305

Int. Cl.[3] G02B 5/14

U.S. Cl. 350—96.23 **5 Claims**



1. A method for producing a plastic pipe capable of transmitting optical signals as well as for carrying a fluid such as water therein, said method comprising:

extruding a plastic hollow tube to form a plastic pipe capable of carrying fluid therein; and

simultaneously with the extruding of said plastic tube, affixing at least one fiber optic tube to the wall of said plastic tube such that the fiber tube becomes a permanent integral part of the plastic pipe formed from the plastic tube.

4,330,175

BLAZED DIFFRACTION GRATING STRUCTURES AND METHOD OF MANUFACTURING THE SAME

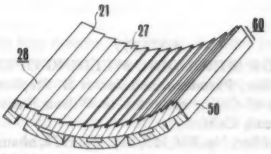
Yohji Fujii, Yokohama, and Junichiro Minowa, Yokosuka, both of Japan, assignors to Nippon Telegraph & Telephone Public Corporation, Tokyo, Japan

Filed Jul. 17, 1979, Ser. No. 58,382

Claims priority, application Japan, Jul. 18, 1978, 53/87344; Apr. 4, 1979, 54/40517; Apr. 6, 1979, 54/41669

Int. Cl.[3] G02B 5/18

U.S. Cl. 350—162 R **1 Claim**



1. A diffraction grating structure comprising a planar diffraction grating including a single crystalline silicon substrate having a major surface {hkl} (where h=k) provided with a plurality of triangular grooves at a pitch of P, each groove having an asymmetric cross-sectional shape and {111} planes as walls of each groove formed in the major surface {hkl} which is inclined by an angle of θ with respect to the {111} plane so as to satisfy the equation

$$\theta = \sin m\lambda_B/2P$$

where θ represents a blaze angle, P the pitch of the groove, λ_B the blaze wavelength and m the order of diffraction; a metal coat layer having a uniform thickness and applied to the walls of each of said triangular grooves upon which light is incident; and wherein said planar diffraction grating is flexed below its elasticity limit to obtain a curved diffraction grating structure.

4,330,176

LENS ASSEMBLY FOR ENABLING CHANGE OF IMAGE POSITION IN A CAMERA

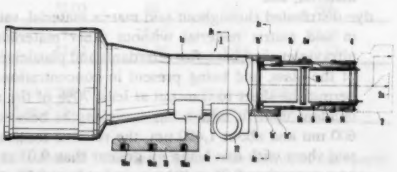
Tohoru Kawai, Kawasaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 14, 1980, Ser. No. 196,439

Claims priority, application Japan, Oct. 18, 1979, 54-144061[U]; Jan. 10, 1980, 55-1302[U]

Int. Cl.[3] G02B 7/04

U.S. Cl. 350—252 **4 Claims**



1. A lens assembly for a camera adapted to enable change in the image position by rotation of the camera relative to components of the lens assembly comprising:

lens barrel means divided into a first lens barrel member and a second lens barrel member;

(a) said first lens barrel member having holding means for affixing said lens barrel means to a tripod;

(b) said second lens barrel means having diaphragm means operatively mounted therein and including means for mounting said lens barrel means upon a camera;

(c) said second lens barrel member being arranged to be rotatable about the optical axis of said lens assembly relative to said first lens barrel member.

4,330,177

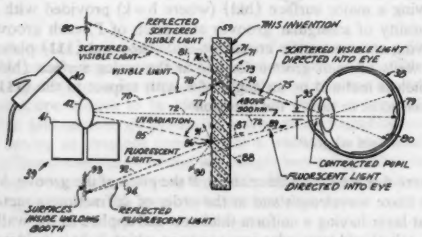
CURTAIN FOR SHROUDING WELDING OPERATIONS

Charles G. Miller, Pasadena, and James B. Stephens, La Crescenta, both of Calif., assignors to Wilson Sales Company, Inc., Rosemead, Calif.

Continuation of Ser. No. 946,163, Sep. 27, 1978, abandoned. This application Oct. 27, 1980, Ser. No. 201,052

Int. Cl.³ G02B *5/22*

U.S. Cl. 350—311 **57 Claims**



1. In combination with a welding workspace containing an electrical arc welding or electrical arc cutting mechanism which emits intense radiation, a curtain of substantial area forming a barrier to visually deleterious light, whereby to protect from damage the eyes of an observer who is located on the opposite side of said curtain from said arc, said curtain comprising:

an organic plastic matrix material which itself is inherently transparent and which is formed into a sheet with a pair of surfaces and a dimension of thickness between said surfaces;

an ultraviolet absorber distributed throughout said matrix material; and

dye distributed throughout said matrix material, said dye, if in said matrix material without other materials except ultraviolet absorbers, fire retardants and plasticizers, being of the class, and being present in concentrations, which permit the sheet to transmit at least 70% of the radiation incident upon it which has wavelengths between about 600 nm and about 1,400 nm, the relative transmission of said sheet with dye being no greater than 0.01 at 450 nm, no greater than 0.05 at 491 nm, and at least 0.70 at 600 nm, said curtain being sufficiently clear for said observer to see through it an object of substantial size located on the other side of said curtain.

4,330,178

ILLUMINATED SUBJECT MATTER IMAGE DISSECTING AND ELEMENTAL LIGHT OUTPUT ALIGNMENT CONTROL MEANS

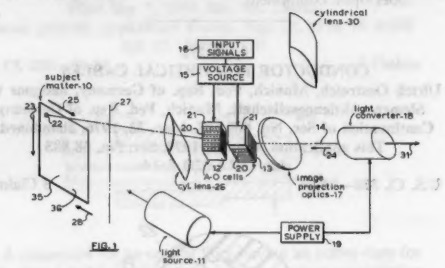
Joseph T. McNaney, 8548 Boulder Dr., La Mesa, Calif. 92041

Filed Oct. 29, 1979, Ser. No. 89,217

The portion of the term of this patent subsequent to Dec. 23, 1997, has been disclaimed.

Int. Cl.³ G02F *1/11*

U.S. Cl. 350—358 **3 Claims**



1. In an image projection and optical axis alignment control system,

(a) a source of light representative of illuminated graphical information;

(b) at least one acousto-optic light reflector having an acoustic-wave generator and an acoustic-optic interaction medium, said information and said medium positioned along a common optical axis of said system;

(c) a source of ultrasonic frequency voltages and circuit means for controlling a connecting of individual voltages from said source to said generator for an establishing of corresponding acoustic wave light reflecting conditions within said medium and an effecting of optical path relationships, respectively, between selected portions of said information and said optical axis;

(d) means for connecting a series of individual voltages from said source to said generator and an establishing of a corresponding series of said light reflecting conditions within said medium, said light reflecting conditions providing optical path relationships, respectively, between a series of predetermined portions of said information and said optical axis and an alignment of an optical image of each said portion with said optical axis.

4,330,179

VARIABLE MAGNIFICATION PROJECTION DEVICE

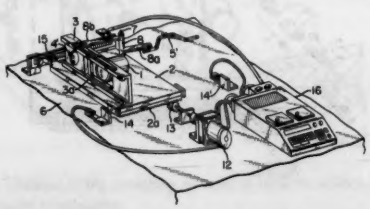
Shiro Sato, Hachioji, Japan, assignor to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed May 12, 1980, Ser. No. 148,814

Claims priority, application Japan, May 17, 1979, 54/59661; May 17, 1979, 54/64875[U]

Int. Cl.³ G02B *7/14, 15/10*

U.S. Cl. 350—422 **2 Claims**



1. In a variable magnification projection device for an electrophotographic copying machine having a principal lens

displaceable along the axis of its optical path and a supplementary lens for movement into and out of the optical path at a fixed conjugate distance from the principal lens as the latter is displaced along said path,

a frame,

a carriage fixedly carrying the principal lens and displaceable within a predetermined range along said optical path with respect to said frame,

sliding rail means on said carriage extending substantially perpendicularly through said optical path and having an opening defined therein through which the axis of the optical path passes, said supplementary lens being movable along the extension of said sliding rail means between a first position in which the supplementary lens is disposed remote from said optical path and a second position in which the supplementary lens is disposed in said optical path,

guide means defined on said frame,

means coupling said supplementary lens to said guide means for causing said supplementary lens to be positioned in said first position thereof remote from the optical path when said carriage is disposed at a first carriage position within said predetermined range and for causing said supplementary lens to be moved along said sliding rail means to said second position thereof remote from the optical path on displacement of said carriage in one direction along the optical path to a second carriage position within said predetermined range, and

means for preventing further displacement of said carriage beyond said first carriage position when the supplemental lens is disposed at said first position thereof and for preventing further displacement of said carriage when the supplemental lens is disposed at said second position.

4,330,180

ZOOM LENS SYSTEM HAVING A PLURAL NUMBER OF RELAY LENSES

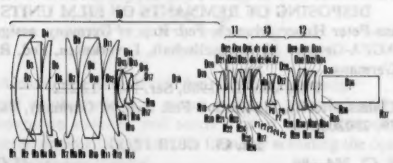
Kazuo Tanaka, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 25, 1979, Ser. No. 78,769

Claims priority, application Japan, Sep. 28, 1978, 53-119488

Int. Cl.³ G02B *15/02, 15/14*

U.S. Cl. 350—427 **5 Claims**



1. A zoom lens system comprising:

a zoom portion including a front lens group for focusing and a plurality of movable lens groups for zooming;

a plurality of rear lens groups, each rear lens group being interchangeable in an optical path between the zoom portion and an image plane, only one rear lens group being arranged in the optical path, and each of said rear lens groups having a different focal length so as to produce a different picture size on the image plane; and

attachment lens means usable in common with all of the rear lens groups, said attachment le[illegible]ans being attachable to the rear lens group on the single optical path between the zoom portion and the image plane to change the focal length of the whole zoom lens system.

4,330,181

COMPACT ZOOM LENS

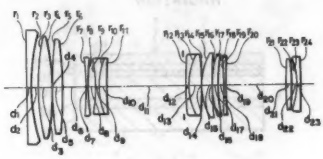
Sadao Okudaira, Ranzan, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 11, 1980, Ser. No. 167,498

Claims priority, application Japan, Jul. 16, 1979, 54-90134

Int. Cl.³ G02B *15/16*

U.S. Cl. 350—427 **6 Claims**



1. A zoom lens system comprising, in order from the object side, a first convergent lens group, a divergent lens group and a second convergent lens group; said first convergent lens group comprising at least three lenses including at least one negative lens component; said divergent lens group comprising at least three lens components including at least one positive lens component; said second convergent lens group comprising at least two positive lens components and at least two negative lens components with the last lens component being a negative lens the surface of smaller radius of curvature of which is directed to the object; said zoom lens satisfying:

	$f = 52.03 \sim 194.00$				FNO. $3.4 \sim 6.1$		
R_1	365.980	D_1	2.00	N_1	1.83481	ν_1	42.7
R_2	63.150	D_2	3.20				
R_3	62.650	D_3	8.04	N_2	1.49700	ν_2	81.3
R_4	−126.230	D_4	0.10				
R_5	132.321	D_5	4.11	N_3	1.48749	ν_3	70.2
R_6	−272.005	D_6	variable (9.76 ~ 42.95)				
R_7	−210.308	D_7	1.40	N_4	1.77250	ν_4	49.6
R_8	118.902	D_8	3.10				
R_9	−44.722	D_9	1.40	N_5	1.75500	ν_5	52.3
R_{10}	37.350	D_{10}	3.80	N_6	1.84666	ν_6	23.9
R_{11}	784.000	D_{11}	variable (35.61 ~ 2.42)				
R_{12}	125.252	D_{12}	1.40	N_7	1.63980	ν_7	34.5
R_{13}	30.750	D_{13}	5.51	N_8	1.49700	ν_8	81.3
R_{14}	−87.527	D_{14}	0.10				
R_{15}	29.210	D_{15}	5.21	N_9	1.61800	ν_9	63.4
R_{16}	142.289	D_{16}	0.20				
R_{17}	58.125	D_{17}	2.57	N_{10}	1.61800	ν_{10}	63.4
R_{18}	102.077	D_{18}	2.60				
R_{19}	−160.000	D_{19}	1.50	N_{11}	1.84666	ν_{11}	23.9
R_{20}	−700.000	D_{20}	24.13				
R_{21}	111.400	D_{21}	3.29	N_{12}	1.83400	ν_{12}	37.2
R_{22}	−66.300	D_{22}	2.64				
R_{23}	−23.370	D_{23}	1.50	N_{13}	1.88300	ν_{13}	40.8
R_{24}	−111.400						

f	52.03	80	135	194
D_6	9.76	22.67	35.47	42.95
D_{11}	35.61	22.70	9.90	2.42

$f_1 = 2.70F_s$ $|f_2| = 0.732F_s$

$f_3 = 0.751F_s$ $N_L = 1.88300$

where f is the overall focal length, R_i is the radius of curvature of the i-th lens surface, D_i is the lens surface interval or lens thickness of the i-th lens surface, N_i is the refractive index of the i-th lens at the d-line, and ν_i is the Abbe number of the i-th lens.

4,330,182

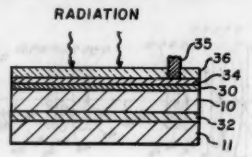
METHOD OF FORMING SEMICONDUCTING MATERIALS AND BARRIERS

John H. Coleman, Locust Valley, N.Y., assignor to Plasma Physics Corporation, Locust Valley, N.Y.

Continuation-in-part of Ser. No. 857,690, Dec. 5, 1977, Pat. No. 4,226,897. This application Apr. 9, 1980, Ser. No. 138,699

Int. Cl.[3] H01L *45/00*

U.S. Cl. 352—2 37 Claims



1. A semiconductor device comprising a body of hydrogenated amorphous silicon having a surface portion in contact with a body of amorphous boron to form a semiconductor junction.

4,330,183

REFLEX DEVICE WITH A MIRROR SUBSTRATE OF VITREOUS CARBON

Erich Kästner, Munich, Fed. Rep. of Germany, assignor to Arnold & Richter Cine Technik GmbH & Co. Betriebs KG, Munich, Fed. Rep. of Germany

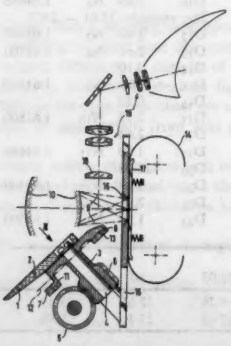
PCT No. PCT/DE79/00070, § 371 Date Mar. 7, 1980, § 102(e) Date Mar. 6, 1980, PCT Pub. No. WO80/00194, PCT Pub. Date Feb. 7, 1980

PCT Filed Jul. 6, 1979, Ser. No. 190,860

Claims priority, application Fed. Rep. of Germany, Jul. 7, 1978, 2829999

Int. Cl.[3] G02B *5/08;* G03B *9/10*

U.S. Cl. 352—206 2 Claims



1. A mirror reflex installation for use in a camera, the mirror reflex installation being mountable in the camera for movement, such as rotating, oscillating, and folding, and comprising:

a mirror substate formed of vitreous carbon and having one surface processed to have a glass-like finish; and

a mirror coating applied to said one surface of said mirror substrate.

4,330,184

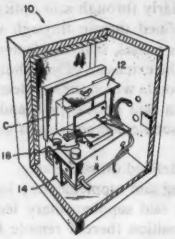
CAMERA-OPERATING DEVICE

James T. Fattore, Jr., Seattle; Robert L. Fattore, Renton; William R. Angevine, Edmonds, and John R. Spence, Mountlake Terrace, all of Wash., assignors to Photo-tronics, Inc., Seattle, Wash.

Filed Sep. 2, 1980, Ser. No. 183,370

Int. Cl.[3] G03B *17/38, 17/42, 29/00*

U.S. Cl. 354—81 5 Claims



1. A camera actuator comprising:

a frame;

means on the frame for supporting a camera, wherein the camera is of the type having a depressible shutter button and a film advance lever that is movable after the film is released by depressing the shutter button;

a motor housing mounted on the frame;

a rotatable motor shaft;

a reversible motor, positioned on the motor housing, for rotating the shaft in either direction;

plate means affixed to the shaft for depressing the shutter button and for advancing the film including

first means to depress the shutter button when the shaft is rotated in a forward direction, and

second means to engage the film advance lever to pivot the lever and to advance the film, after depressing the shutter button, when the shaft is rotated in a reverse direction; and

control means for automatically actuating the motor to turn the shaft so that the shutter button is depressed, and then, the film is advanced.

4,330,185

APPARATUS FOR EXPOSING, DEVELOPING AND DISPOSING OF REMNANTS OF FILM UNITS

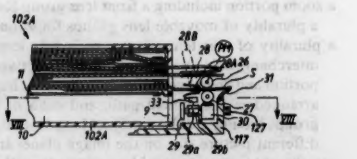
Hans-Peter Huber, Munich, Fed. Rep. of Germany, assignor to AGFA-Gevaert Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jan. 15, 1980, Ser. No. 112,222

Claims priority, application Fed. Rep. of Germany, Jan. 19, 1979, 2902066

Int. Cl.[3] G03B *17/50*

U.S. Cl. 354—86 43 Claims



19. In a photographic apparatus for exposure and development of self-processing film units which are stored in a container during exposure to scene light while the container is

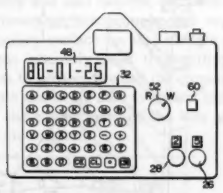
confined in the apparatus, wherein each film unit comprises an image-bearing first portion and a second portion which is separable from the first portion and constitutes waste material upon completion of development of the respective film unit and subsequent separation from the first portion, and wherein the development of film units involves spreading a fluid processing agent between the first and second portions of the respective units, the combination of means for supporting containers with film units; and means for introducing separated second portions of exposed and developed film units into the respective container while the latter is supported by said supporting means, said supporting means including a housing which confines a container during exposure of the respective film units to scene light as well as during introduction of separated second portions of film units into the respective container, said introducing means including pressure applying rolls rotatably installed in said housing and being operative to engage and entrain successive film units from the container within said housing while rotating in a first direction and to introduce the second portions of film units into the container within said housing while rotating in a second direction, reversible prime mover means for said rolls, and means for reversing said prime mover means.

4,330,186

DATA RECORDING DEVICE

Shinichiro Hattori, Tokyo, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Feb. 3, 1981, Ser. No. 231,157
Claims priority, application Japan, Feb. 4, 1980, 55/12288
Int. Cl.³ G03B *17/24*
U.S. Cl. 354—106 **4 Claims**



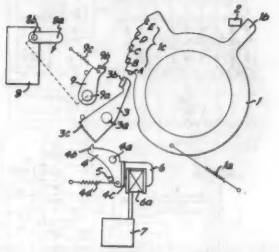
1. A data recording device for camera comprising:
frame number selecting means which is provided with an operation member and sends forth a signal denoting a serial number of a given film frame by actuating the operation member thereof;
data generating means which is provided with an operation member and issues a signal representing a given data by actuating the operation member thereof;
memory means connected to said frame number selecting means and data generating means for causing data corresponding to the data signal to be stored in an address corresponding to a frame number signal;
counting means which is operated in response to a shutter operation of a camera, and emits a count singal representing the number of operation times of the shutter; and
light emitting means providing in a camera in light communication with a film frame and connected to the memory means and to the counting means for emitting light in accordance with data stored in the address of the memory means which corresponds to the count signal.

4,330,187

SELF-TIMER FOR AUTOMATIC FOCUSING CAMERA

Tadashi Nakagawa, Yotsukaido, Japan, assignor to Seiko Koki Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 2, 1980, Ser. No. 183,149
Claims priority, application Japan, Sep. 3, 1979, 54-112548; Sep. 3, 1979, 54-112549
Int. Cl.³ G03B *13/20, 17/38*
U.S. Cl. 354—195 **13 Claims**



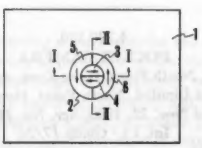
1. A self-timer for the automatic focusing camera capable of automatically determining the focus position of the taking lens by detecting the distance between the camera and an object, provided with a range limiting means having priority to automatic range detection in at least a part of the photographing lens range wherein said range limiting means is operated interlocking with the setting of said self-timer to limit the adjustment of the taking lens within a limited range.

4,330,188

FOCUSING SCREEN

Kazuo Fujibayashi, and Kikuo Momiyama, both of Yokohama, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 20, 1980, Ser. No. 161,433
Claims priority, application Japan, Jun. 22, 1979, 54-78945
Int. Cl.³ G03B *13/28*
U.S. Cl. 354—200 **4 Claims**



1. A focusing screen comprising:
first split prism means located at a central portion on said screen arranged to effect image deviation at least in a first direction and in a second direction opposed to said first direction; and
second split prism means arranged in the peripheral area surrounding said first split prism means, said second split prism means being arranged to effect image deviation at least in a third direction and in a fourth direction opposed to said third direction;
said third and fourth directions extending transversely to said first and second directions.

4,330,189

PHOTOGRAPHING APPARATUS FOR ENDOSCOPE

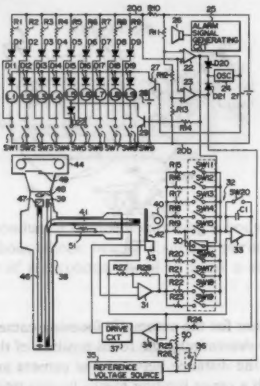
Syuichi Takayama, Hachioji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Oct. 9, 1980, Ser. No. 195,439

Claims priority, application Japan, Oct. 13, 1979, 54-132002; Oct. 13, 1979, 54-132003

Int. Cl.³ G03B 7/00, 17/18; A61B 1/04

U.S. Cl. 354—202 9 Claims



1. An automatic exposure photographing apparatus comprising:

an exposure constant setting circuit including a plurality of exposure constant selection switches respectively corresponding to different exposure constants including high exposure constants, at least one intermediate exposure constant and low exposure constants for selecting a desired one of said exposure constants;

a switch operation detecting circuit for producing a detection signal when detecting the fact that none of said exposure constant selection switches is operated;

an automatic exposure constant setting means for automatically setting said exposure constant setting circuit to said intermediate exposure constant in response to the detection signal from said switch operation detecting circuit;

an exposure calculation circuit for calculating the extent of exposure according to the exposure constant set by said exposure constant setting circuit or by said automatic exposure constant setting means; and

a means for ending exposure in response to the output of said exposure calculation circuit.

4,330,190

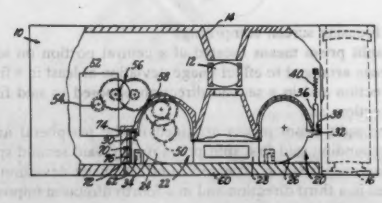
POCKET CAMERA

Kwok Yan Chan, North Point, Hong Kong, assignor to W. Haking Enterprises Limited, North Point, Hong Kong

Filed Nov. 25, 1980, Ser. No. 210,236

Int. Cl.³ G03B 17/26

U.S. Cl. 354—275 4 Claims



1. In a camera having a housing with a film compartment adapted to receive through an opening in the housing a roll of film housed in a cartridge with the cartridge having an abutment on a peripheral surface thereof, said abutment configured as an outwardly directed rib, said cartridge under certain conditions being restrained from easy removal from said compartment, and a closure for closing said opening and movable between open and closed positions, the improvement comprising latch means on said closure and movable therewith, said latch means including a finger having a base portion attached to said closure and a hook-shaped free end portion engageable with said rib when said closure is in said closed position and a resilient portion intermediate said base portion and said free end portion normally biasing said free end portion to a first rib-engaging position and accommodating movement thereof from said first position by a camming action by said rib when said closure is moved from said open position towards said closed position, said free end portion interlocking with said rib when a cartridge is in said compartment and said closure is moved to said closed position, said latch means moving said cartridge towards said opening to release the cartridge from the restrained condition as said closure is moved from said closed position toward said open position.

4,330,191

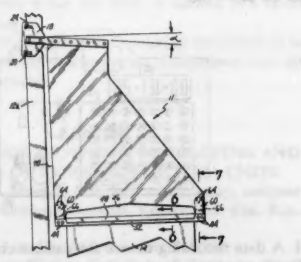
CONNECTOR DEVICE FOR ATTACHING PHOTOGRAPHIC WEB MATERIAL TO A LEADER BELT

Robert M. Rawlings, Brooklyn Park; Derold D. Heim, Long Lake, and Ronald E. Morain, Shakopee, all of Minn., assignors to Pako Corporation, Minneapolis, Minn.

Filed Feb. 17, 1981, Ser. No. 235,105

Int. Cl.³ G03D 13/10, 3/13

U.S. Cl. 354—345 17 Claims



1. A device for attaching a photographic print paper web to a leader belt of a photographic processor and for leading the print paper web through the processor, the device comprising:

belt clip means for attachment to the leader belt;

a leader bar rigidly attached to the belt clip means;

a pull bar spaced behind the leader bar, the pull bar being adapted to have a leading end of the print paper web attached thereto; and

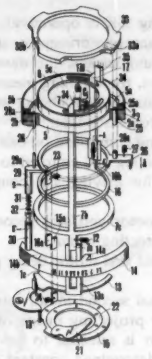
a flexible connective member connecting the leader bar and the pull bar in a fixed non-parallel relationship such that when the leader belt is placed in motion, tension is transmitted to the print paper web from the leader belt to cause the leader bar to move from a first position to a second position with respect to the leader belt and the pull bar to move to a perpendicular position with respect to the leader belt, such that the print paper web attached to the pull bar is aligned parallel to the leader belt.

4,330,192

INTERCHANGEABLE LENS ASSEMBLY FOR A CAMERA

Seiichi Shimizu, Kawasaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 2, 1981, Ser. No. 222,731
Claims priority, application Japan, Jan. 18, 1980, 55-5101; Jan. 23, 1980, 55-6687
Int. Cl.[3] G03B *17/00, 9/02*
U.S. Cl. 354—286 17 Claims



14. An interchangeable lens assembly for a camera comprising:

coupling means adapted to engage complementary coupling means on said camera for mounting said lens assembly on said camera;

exposure control mode changing means for changing the operation mode of said lens assembly between an automatic exposure control mode and a manual exposure control mode, and having a transmitting member for transmitting a control mode change signal between said lens assembly and said camera; said lens assembly including a reference surface brought into engagement with a complementary surface on said camera during mounting of said lens assembly, said transmitting member being biased so as to project toward the camera from said reference surface and being able to retract into said lens assembly when the engagement of the lens assembly with the camera is incomplete.

4,330,193

DEVELOPMENT SYSTEM

Klaus K. Stange, Pittsford, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Oct. 1, 1979, Ser. No. 80,650
Int. Cl.[3] G03G *15/09*
U.S. Cl. 355—3 DD 16 Claims

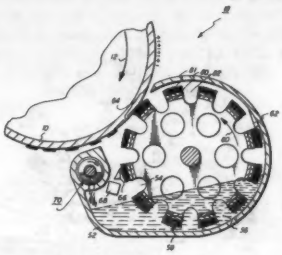
1. An electrophotographic printing machine of the type in which an electrostatic latent image recorded on a photoconductive member is developed with a developer material, wherein the improvement includes:

means for storing a supply of developer material;

a plurality of elongated magnetic members for attracting the developer material thereto;

means for rigidly supporting said magnetic members with adjacent magnetic members being spaced from one another and the longitudinal axes thereof substantially parallel to one another so that said magnetic members form the exterior circumferential surface of a cylindrical configuration defining an interior chamber with developer passing between adjacent magnetic members to the interior chamber and returning to said storing means, said supporting means being positioned relative to the photoconductive member to define a pre-selected gap between said magnetic members and the photoconductive member; and

means for moving said supporting means so that said magnetic members transport the developer material from said storing means into contact with the latent image recorded on the photoconductive member so as to deposit developer material on the photoconductive member in image configuration, said moving means moving said supporting means at a preselected velocity relative to the photoconductive member to maintain the area of developer material contacting the photoconductive member at a preselected size.

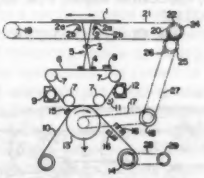


4,330,194

METHOD OF DRIVING COPY MATERIAL AND PHOTOSENSITIVE MEMBER OF COPYING APPARATUS

Kakuji Murakami, Kawasaki, Japan, assignor to Ricoh Co., Ltd., Japan

Filed Dec. 10, 1979, Ser. No. 101,582
Claims priority, application Japan, Dec. 15, 1978, 53-154122
Int. Cl.[3] G03G *15/22;* B65H *17/18*
U.S. Cl. 355—3 R 10 Claims



1. A method of driving a copy material and a photosensitive member of a copying apparatus wherein the photosensitive member has a toner image of an original arranged thereon which is formed by charging, exposing and developing, and wherein the copy material is fed to a transfer position in which the copy material is brought into contact with the photosensitive member to receive the toner image from the photosensitive member, such method comprising the step of:

driving one of the photosensitive member and the copy material through a transmission;

contacting the photosensitive member with the copy material at the transfer position;

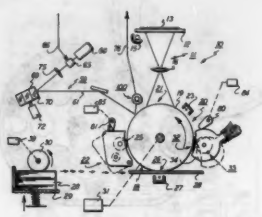
applying a bias voltage between the photosensitive member and the copy material to form an electrostatic force between the photosensitive member and the copy material; and

driving both the photosensitive member and the copy material in synchronism by driving the other one of the photosensitive member and the copy material by the electrostatic attractive force.

4,330,195
MULTIPLE MODE IMAGE PROCESSING APPARATUS AND METHOD

Pierre A. Lavallee, Penfield, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Feb. 19, 1980, Ser. No. 122,560
Int. Cl.[3] G03G *15/00*
U.S. Cl. 355—3 R 25 Claims



12. In a xerographic type reproduction apparatus having a movable photoconductive member, the combination of:

means for producing images on said photoconductive member;

image reading means for reading said images to provide image signals representative of the images read;

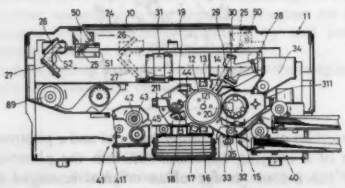
data transmission means for said image signals, said data transmission means being adapted to transmit said image signals at a predetermined image signal transmission rate; and

drive means for moving said photoconductive member either continuously or in steps at a speed compatible with said predetermined image signal transmission rate.

4,330,196
ELECTROPHOTOGRAPHIC COPYING APPARATUS

Isao Yamaguchi, Yawata, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Feb. 13, 1980, Ser. No. 120,986
Claims priority, application Japan, Feb. 22, 1979, 54-20464; Feb. 23, 1979, 54-21257
Int. Cl.[3] G03G *15/28*
U.S. Cl. 355—8 8 Claims



1. An electrophotographic copying apparatus comprising:

a photoreceptor having a photoconductive outer layer which photoreceptor is rotatably disposed,

a corona charger for preliminarily charging the photoconductive outer layer of said photoreceptor,

an optical scanning means including illuminating means for an original to be copied, an optical system for projecting a light image from said original onto said preliminarily charged photoconductive layer and a driving means to drive at least the illuminating means and the optical system in a manner relatively to scan on the original, thereby to produce an electrostatic latent image on said photoconductive layer,

a developing means for developing the latent image into a visible toner image by contact of toner on said conductive layer,

a transferring means for transferring said toner image onto a transfer material sheet which is fed by a sheet feeding device,

a cleaning means for removing residual toner after the transferring,

a fixing means disposed in the path of the transfer material and including a fixing device for fixing the transferred visible toner image on said transfer material,

a transfer material advancing means for advancing said transfer material from a feeder onto the outer surface of said photoreceptor and through said fixing means to an outlet, and

an apparatus housing for, in operatively incorporated relation, containing the photoreceptor, the corona charger, the optical scanning means, the developing means, the transferring means, the cleaning means, the fixing means and the transfer material advancing means,

wherein the improvement is that:

the apparatus housing comprises, on one side part thereof, a first motor for driving and coupled to the photoreceptor, a second motor for driving and coupled to the optical scanning means,

each of said first motor and said second motor having a rotation speed detecting means,

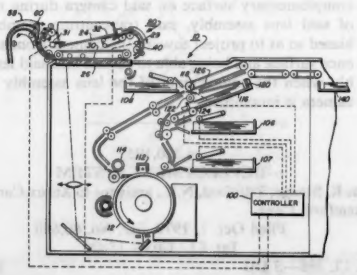
rotation speed of said first motor being predetermined constant, and

rotation speed of said second motor during forward direction scanning for projecting image of said original onto the photoreceptor is selected to have a predetermined ratio to said predetermined constant speed by means of output signals of said rotation speed detecting means.

4,330,197
RECIRCULATING DOCUMENTS DUPLEX COPIER

Richard E. Smith, Webster, and John R. Yonovich, Shortsville, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Continuation of Ser. No. 57,855, Jul. 16, 1979, abandoned. This application Jul. 28, 1980, Ser. No. 172,807
Int. Cl.[3] G03G *15/00*
U.S. Cl. 355—14 SH 12 Claims



1. In a document handling apparatus for plurally recirculating a set of simplex original document sheets to a copier to be copied onto both sides of copy sheets to form pre-collated duplex copy sets, the improvement comprising:

means for circulating the documents in reverse (descending) serial page order beginning with the last sheet in the document set and ending with the first sheet in the document set,

odd/even determining means for automatically determining whether there are an odd or an even number of original documents in said document set before they are copied, and

copying control means, controlled by said odd/even determining means, to inhibit copying of the last, or next to last,

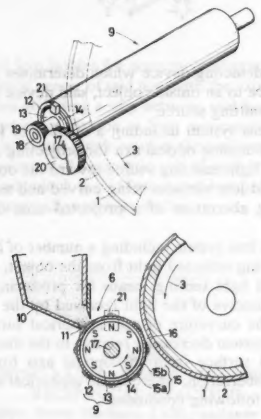
and alternate subsequent documents on the first copying circulation of said document set in response to a determination by said odd/even determining means whether there are an odd or even number of original documents in said set, to provide properly collated output duplex copy sets without variable output inversion.

4,330,198

MAGNETIC BRUSH DEVELOPING DEVICE FOR ELECTROSTATIC COPYING APPARATUS

Joji Matsumoto, Neyagawa, and Yuji Hasegawa, Nishinomiya, both of Japan, assignors to Mita Industrial Company Limited, Osaka, Japan

Filed Aug. 6, 1980, Ser. No. 175,861
Claims priority, application Japan, Aug. 7, 1979, 54-100947
Int. Cl.[3] G03G *15/00*
U.S. Cl. 355—14 D 5 Claims



1. A magnetic brush developing device for use in applying a developing material circumferentially to an electrostatic latent image retaining member of an electrostatic copying apparatus, said device comprising:

developing roller means for forming on a surface thereof a magnetic brush formed of developing material and including circumferentially alternate high bristle portions and low bristle portions, said developing roller means comprising a cylindrical sleeve receiving on the outer surface thereof said magnetic brush and adapted to be positioned adjacent to a surface of an electrostatic latent image retaining member of an electrostatic copying apparatus at a developing zone, and a magnet roller rotatably mounted within said cylindrical sleeve for, upon rotation of said magnet roller, causing said high and low bristle portions of said magnetic brush to pass alternately through said developing zone and to apply said developing material to the surface of the electrostatic latent image retaining member;

driving means;

one-way clutch means for transmitting rotation to said magnet roller from said driving means; and

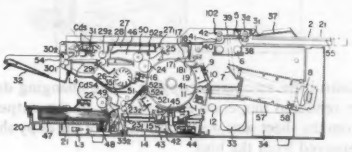
means for, upon stopping of said driving means, causing said magnetic roller to stop at a rotational position thereof such that a said low bristle portion of said magnetic brush is at said developing zone and is spaced from the surface of the electrostatic latent image retaining member, said means comprising a magnetic permeable member fixed adjacent to an end of said developing roller means.

4,330,199

ELECTROPHOTOGRAPHIC DEVICE

Shigehiro Komori; Hisashi Sakamaki, both of Yokohama; Hiroyuki Hattori, Mitaka; Toshihide Iida; Koichi Miyamoto, both of Tokyo, and Kazumi Umezawa, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 778,180, Mar. 16, 1977, Pat. No. 4,185,909, which is a continuation of Ser. No. 660,860, Jul. 31, 1975, abandoned, which is a continuation of Ser. No. 348,092, Apr. 5, 1973, abandoned. This application Apr. 27, 1979, Ser. No. 34,023
Claims priority, application Japan, Apr. 13, 1972, 47-37288; Apr. 15, 1972, 47-38149; Jun. 20, 1972, 47-72961[U]
Int. Cl.[3] G03G *15/00*
U.S. Cl. 355—14 CH 6 Claims



1. A copying apparatus comprising:

a rotatable medium;

processing means, including charging means and means for imagewise exposing said rotatable medium, for forming an image of an original to be copied on said rotatable medium and for transferring the image onto a transfer material;

means for removing residual charge on said rotatable medium;

means for presetting a desired number of copies to be produced;

means for instructing the start of an image forming process;

means for operating said charging means during the formation of the preset number of copies and for rotating said rotatable medium during the operation of said processing means and removing means to produce the preset number of copies;

post-rotation means for continuing the rotation of said rotatable medium for a predetermined time after termination of the image forming process with said charging means disabled and said removing means operating; and

control means for controlling the restart of said processing means without completing the post-rotation in response to actuation of said instructing means before the termination of rotation of said rotatable medium but after termination of the image forming process, said control means being operable to maintain said charging means operative for immediate restart of the exposing operation when said instructing means is actuated before said charging means is disabled.

4,330,200

COPYING MACHINE WITH COLLATING APPARATUS

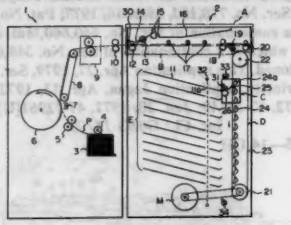
Hideo Kikuchi; Tamaki Kaneko; Sunao Ikeda; Tugio Okuzawa; Yohtaro Kakitani, and Kunio Hibi, all of Tokyo, Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Sep. 24, 1980, Ser. No. 190,105
Claims priority, application Japan, Apr. 15, 1980, 55-049899
Int. Cl.[3] G03B *27/42*; B65H *39/07, 39/11*
U.S. Cl. 355—24 4 Claims

1. A copying machine including a collating apparatus provided with an automatic copying mode changing device for automatically changing a copying mode comprising at least one of a collation mode and a sorting or assortment mode during copying operation to a normal copying mode after a predetermined length of time upon completion of the copying operation, comprising:

sheet sensor means provided in the collating apparatus for detecting presence of at least one copy sheet in any of bins

of the collating apparatus and producing an output signal indicating the presence of the copy sheet in the bin; and control means operatively connected to the automatic copying mode changing device and the sheet sensor means to



control the automatic copying mode changing device to be rendered inoperative in response to the output signal from the sheet sensor means until all of the copy sheets are removed from the bins.

4,330,201

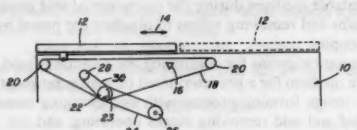
SCANNER DRIVE CLUTCH

Gary B. Walker, R.F.D. #1, Litchfield, N.H. 03051

Filed Jul. 7, 1980, Ser. No. 166,329

Int. Cl.³ G03B *27/48, 27/50*

U.S. Cl. 355—50 **3 Claims**



1. A photocopier scanner drive assembly for reciprocal movement of a scanning element comprising:

a rotatable drive shaft coupled to said scanning element to move said scanning element in response to rotation of said drive shaft,

first drive means for rotating said drive shaft in a first rotation direction, and

second drive means for rotating said drive shaft in a second rotation direction to return said scanning element to a starting position, comprising:

an energizable driver member,

a differential one way drive mechanism having a first element connected to said drive shaft, and a second element arranged with respect to the first element to move together with it when the second element is moved in a first differential drive direction, and to move independently of the first element when the second element is moved in a second differential drive direction,

a linking driving means drivingly connecting said driver member to said second element when said driver member is energized to move the second element in said first differential direction and said drive shaft in said second rotation direction while returning said scanning element to its starting position.

4,330,202

RANGE DETECTING DEVICE

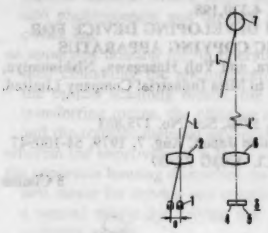
Hideo Yokota, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 10, 1979, Ser. No. 101,648

Claims priority, application Japan, Dec. 11, 1978, 53-153370

Int. Cl.³ G01C *3/10, 5/00*; B29D *13/18*; G03B *7/08*

U.S. Cl. 356—1 **2 Claims**



1. A range detecting device which determines the distance from the device to an outside object, said device comprising:

(a) a light emitting source;

(b) a first lens system including a number of lens surfaces having a common optical axis for projecting a light beam from said light emitting source toward the object, at least one of said lens surfaces being curved and aspherical for correcting aberration of a projected area of said light beam;

(c) a second lens system including a number of lens surfaces for receiving reflected light from the object; and

(d) reflected light sensing means for producing an output signal indicative of the light received by the second lens system; the curvature of said aspherical surface of said first lens system decreasing relative to the distance of said aspherical surface from the optical axis for correcting spherical aberration, wherein said aspherical surface satisfying the following conditions:

$$x = R\left\{1 - \left(1 - \frac{y^2}{R^2}\right)^{\frac{1}{2}}\right\} + By^4 + Cy^6$$

wherein x represents the optical axis direction, y represents the direction perpendicular to the x direction, and R represents curvature around the optical axis and

$$0.45/f^8 < |B| < 0.75/f^8,\ 1.2/f^6 < |C| < 2.6/f^6$$

wherein the first lens system includes at least a lens having an aspherical surface and f is the focal length of the lens having the aspherical surface.

4,330,203

OPTICAL LENS LAYOUT AND BLOCKING DEVICE

Gerd Oppenheim, 73 Sunview Dr., San Francisco, Calif. 94131, and Angus MacDonald, 1711-24th Ave., Oakland, Calif. 94601

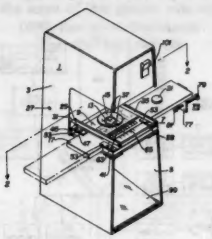
Filed Oct. 15, 1979, Ser. No. 84,848

Int. Cl.³ B22D *19/00*

U.S. Cl. 356—127 **9 Claims**

1. A single optical lens layout and blocking device for locating and aligning the contemplated geometric center of a finished lens with a block to be secured to such lens at said contemplated geometric center for holding said lens for contouring, comprising a housing, a lens holder including an opening therethrough in alignment with a lens when placed thereon, means supporting said lens holder on said housing, a slider in spaced relationship to said lens holder, means for lineraly

guiding said slider for movement with relationship to said lens holder in a plane substantially parallel to the plane of said lens holder, means for using a grid on said slider in conjunction with said lens holder for accurately locating and aligning said contemplated geometric center of said lens with the axis of said lens holder opening, means for supporting a block in a fixed position on said slider, means for using said slider in conjunction with said lens holder for accurately aligning the contemplated geometric center of said lens with the axis of said block, said last means including a stop between said housing and said slider adjusted as to position to limit movement of said slider when the axis of said block reaches the position of alignment with the contemplated geometric axis of such lens, and means for securing said block to said lens at said lens geometric center in said accurately aligned relationship.

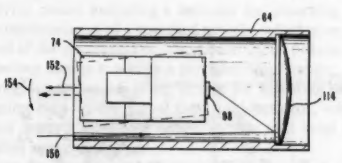


4,330,204

SELF-ALIGNING LASER COMMUNICATOR UTILIZING RECIPROCAL TRACKING

Richard A. Dye, Santa Barbara, Calif., assignor to Santa Barbara Research Center, Goleta, Calif.

Filed Nov. 16, 1979, Ser. No. 95,178
Int. Cl.³ G01B *11/26;* H04B *9/00*
U.S. Cl. 356—152 **7 Claims**



1. Alignment apparatus for a reciprocal tracking laser communicator system including a cylindrical transceiver having oppositely disposed laser transmitter and detector, the optical axis of said laser transmitter being collinear with the center of said detector, which comprises:

(a) an outer cylinder having an open and a closed end;

(b) said closed end of said outer cylinder having a spherical, mirrored inner surface;

(c) means for mounting said cylindrical transceiver within said outer cylinder; and

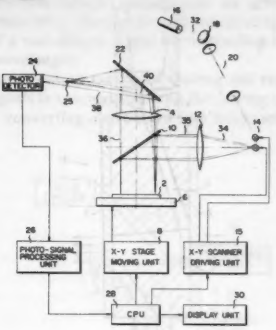
(d) means for rotating said cylindrical transceiver relative to said outer cylinder, said means being responsive to optical energy incident upon said detector so that said cylindrical transceiver is automatically aligned to the direction of said incoming signal.

4,330,205

OPTICAL APPARATUS FOR MEASURING THE SIZE AND LOCATION OF OPTICAL IN AN ARTICLE

Teruo Murakami, Yokohama; Kiyoshi Yamada, Tokyo, and Masana Minami, Kawasaki, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Jan. 3, 1980, Ser. No. 109,217
Claims priority, application Japan, Jan. 12, 1979, 54-1287; Jan. 24, 1979, 54-6120
Int. Cl.³ G01B *11/30;* G01N *21/47*
U.S. Cl. 356—237 **3 Claims**



1. An optical apparatus for inspecting optical defects comprising:

(a) a laser unit for generating a laser beam;

(b) a collimating means for converting said laser beam into a light beam consisting of parallel light rays and having a diameter of a predetermined size;

(c) an X-Y scanner for subjecting said light beam to two-dimensional scanning;

(d) a driving means for driving said X-Y scanner;

(e) a table means adapted for supporting an article having a flat surface to be inspected;

(f) a light beam projection lens system having a forward focal point and a backward focal point, the forward focal point being positioned at said X-Y scanner to converge the light beam from the collimating means and adapted to project it substantially in parallel with an optical axis thereof onto the flat surface of said article, the projected light beam defining a beam spot having a diameter determined in accordance with the defect to be detected and larger than that of the circle of least confusion of the converged light beam, the light beam converted by said collimating means having a diameter determined in accordance with the diameter of the beam spot;

(g) a light directing means arranged in a light beam path between said table means and said light beam projection lens system and adapted to direct the converged light beam in a direction which is perpendicular to the article surface;

(h) a converging lens system having a forward focal point, a backward focal point and an optical axis adapted to intersect the article surface at a right angle, the forward focal point adapted to be positioned at said article surface such that the light rays of the light beam spot are converged on the article surface;

(i) a spatial filter means positioned at the backward focal point of said converging lens system and adapted to transmit therethrough only light rays irregularly reflected or scattered by said article,

(j) a photo-detecting unit for detecting the light rays transmitted through said spatial filter, and

(k) an analyzing means for analyzing, to obtain the size and location of, defects on said article in accordance with output signals from said photodetecting unit and driving signals from said X-Y scanner driving means.

4,330,206

CUVETTE FOR USE IN OPTICAL MEASUREMENTS

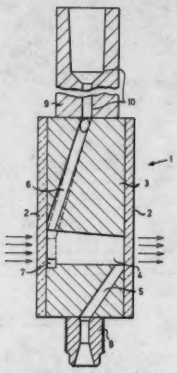
Hans Gausmann, and Walter Geis, both of Aalen, Fed. Rep. of Germany, assignors to Carl Zeiss-Stiftung, Oberkochen, Fed. Rep. of Germany

Filed Feb. 1, 1980, Ser. No. 117,792

Claims priority, application Fed. Rep. of Germany, Feb. 9, 1979, 2904909

Int. Cl.³ G01N *1/10*

U.S. Cl. 356—246 3 Claims



2. In a cuvette cell for optical measurements on liquid samples for use as a flow-through or suction cell wherein a measurement channel has windows for the directional passage of radiation and separate openings for the filling and emptying thereof, said openings being adjacent to said windows, the improvement in which, with respect to the operational orientation of the cell,

(a) the measurement channel extends approximately horizontally and has an upper wall surface which slopes upwardly in the liquid-flow direction,

(b) said windows are flat and perpendicular to the direction of said radiation, and

(c) the opening for emptying said measurement channel comprises two outlet passage means, one of said passage means communicating with the lowest point and the other communicating with the highest point of the outlet end of said channel.

4,330,207

FLUORESCENCE SPECTROPHOTOMETER

Taro Nogami, and Hiroshi Hirose, both of Katsuta, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jun. 5, 1979, Ser. No. 45,630

Claims priority, application Japan, Jun. 5, 1978, 53-66718

Int. Cl.³ G01N *21/64*

U.S. Cl. 356—318 4 Claims

1. A fluorescence spectrophotometer comprising

a light source,

an excitation side monochromator which subjects lights from said light source to spectroscopic analysis for illuminating as actinic light a sample,

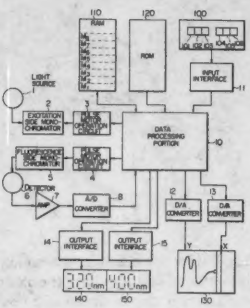
a fluorescence side monochromator which subjects fluorescence light from said sample to spectroscopic analysis,

a detector which detects light from said fluorescence side monochromator,

an A-D converter which converts the output from said detector into a digital form,

memory means for storing values of the wavelengths, peak value and peak wavelength of the spectrum of said sample, and

data processing means responsive to the output of said A-D converter for applying said values to said memory means, including means for comparing the peak value stores in said memory means with the value of the output from said A-D converter as one of said two monochromators is wavelength-scanned and the other is fixed in wavelength and for storing in said memory means as said peak value the larger one of said values, means responsive to detection of the wavelengths of said two monochromators being substantially equal for rejecting the output of said



A-D converter as a peak value to be stored in said memory means, means for detecting the peak value for setting the wavelength of said one of said two monochromators to the wavelength corresponding to the peak value, and recorder means which, after said data processing portion has fixed said one of said two monochromators to said peak wavelength, wavelength-scans said other of said two monochromators and records in the thus-obtained spectrum of said sample.

4,330,208

PROCESS AND APPARATUS FOR REGULATING THE IMPACT OF A LIGHT BEAM ON A TARGET

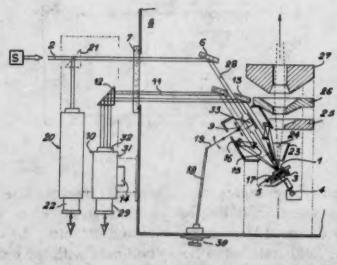
Jean-Francois Eloy, Saint Ismier, France, assignor to COMMISSARIAT a l'Energie Atomique, Paris, France

Filed Apr. 9, 1980, Ser. No. 138,712

Claims priority, application France, Apr. 18, 1979, 79 09763

Int. Cl.³ G01N *21/63;* B23K *26/02, 26/06*

U.S. Cl. 356—318 10 Claims



1. A process for regulating the impact of a light beam emitted by a source on a target, wherein it comprises regulating the position and dimensions of the impact by respectively using two beams whose optical paths are coaxial, the light beam of the source being monochromatic, the position and dimensions of the impact being regulated in white light, the optical path of the location regulating beam being coaxial to the optical path of the beam of the source, and the optical path of the impact dimension regulating beam partially coinciding with the optical path of the beam of the source.

4,330,209

SPECTROPHOTOMETER RECEIVING A VARIABLE QUANTITY OF LIGHT

Noriyoshi Hashimoto, Chofu; Mikio Ito, and Kikuo Tamura, both of Yokohama, all of Japan, assignors to Nippon Kogaku K.K., Tokyo, Japan

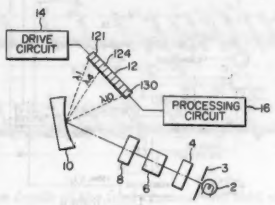
Filed Aug. 27, 1979, Ser. No. 69,924

Claims priority, application Japan, Aug. 28, 1978, 53/103786; Aug. 28, 1978, 53/103787

The portion of the term of this patent subsequent to Mar. 23, 1999, has been disclaimed.

Int. Cl.[3] G01J *3/38*

U.S. Cl. 356—328 8 Claims



2. A spectrophotometer provided with a light diffracting element for obtaining diffracted light, comprising:

image sensor means adapted for receiving said diffracted light and provided with photoelectric converting elements storing a charge corresponding to the quantity of light received by it within a predetermined integration time and discharging said charge by the driving thereof;

drive means for sequentially driving said photoelectric converting elements of said image sensor means, said drive means being capable of varying said integration time;

wavelength designating means capable of designating any desired wavelength;

selecting means for selecting a photoelectric conversion signal corresponding to the wavelength designated by said wavelength designating means from among the photoelectric conversion signals sequentially put out by said image sensor means and for putting out the same; and

operating means for applying an appropriate operating process to the photoelectric conversion signal put out by said selecting means;

said drive means including a detector for detecting, during the measurement of a standard sample, whether or not the level of the photoelectric conversion signal put out by said selecting means is within a predetermined range;

an integration time adjusting device for adjusting said integration time by the signal from said detector, when said level departs from said range, so that said level may be within said range; and

a driver for driving said photoelectric converting elements on the basis of the integration time adjusted by said adjusting device.

4,330,210

SPECTROPHOTOMETER CAPABLE OF CORRECTING A DARK CURRENT

Noriyoshi Hashimoto, Chofu; Mikio Ito, and Kikuo Tamura, both of Yokohama, all of Japan, assignors to Nippon Kogaku K.K., Tokyo, Japan

Filed Aug. 27, 1979, Ser. No. 69,926

Claims priority, application Japan, Aug. 28, 1978, 53-103789

The portion of the term of this patent subsequent to Mar. 23, 1999, has been disclaimed.

Int. Cl.[3] G01J *3/38*

U.S. Cl. 356—328 4 Claims

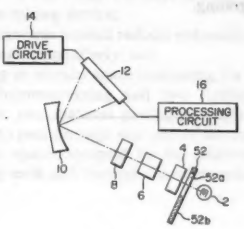
1. A spectrophotometer provided with a diffracting element for spectroscopically dividing the light from a light source, comprising:

an image sensor adapted to receive the light spectroscopically divided by said diffracting element at photoelectric converting elements corresponding to different wavelengths;

driving means for the image sensor for sequentially driving the photoelectric converting elements of said image sensor and for causing said image sensor to put out time sequential photoelectric conversion signals;

wavelength designating means having a wavelength designating portion which can designate an arbitrary wavelength externally, the wavelength designating means putting out a wavelength signal corresponding to the designated wavelength;

address signal output means for putting out respective address signals in synchronism with the driving of the photoelectric converting elements of said image sensor;



coincidence signal output means for receiving and comparing said wavelength signal and said address signal and for putting out a coincidence signal when said wavelength signal and said address signal correspond to each other;

gate means for receiving electrical signals time-sequentially put out by said image sensor and putting out said electrical signal synchronized with said coincidence signal;

light-intercepting means for shielding the photoelectric converting elements of said image sensor from light;

memory means having first and second memory portions for discretely storing the electrical signal put out by said gate means depending on whether or not the photoelectric converting elements of said image sensor are shielded from light; and

a subtraction circuit for subtracting the stored content of said second memory portion from the stored content of said first memory portion.

4,330,211

METHOD AND APPARATUS FOR DETECTING SMALL ANGULAR BEAM DEVIATIONS

Phillip R. Peterson; Athanasios Gavrielides, both of Albuquerque, N. Mex., and John H. Erkkila, Dayton, Ohio, assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Mar. 7, 1980, Ser. No. 128,344

Int. Cl.[3] G01B *9/02*

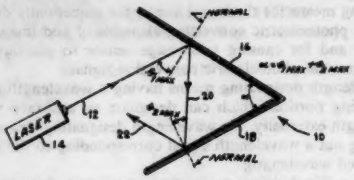
U.S. Cl. 356—354 10 Claims

1. An apparatus for detecting small angular deviations of an input beam comprising:

(a) a first diffraction grating, said first diffraction grating being positioned with respect to said input beam such that said input beam is incident on said first grating at an angle, θ_{1max}, with respect to a normal to said first grating and wherein θ_{1max} is preselected such that said input beam is diffracted from said first grating at maximum intensity,

(b) a second diffraction grating, said second diffraction grating being positioned at a preselected angle, α, with respect to said first diffraction grating such that said diffracted beam from said first grating is incident on said second grating at an angle, θ_{2max}, with respect to a normal

to said second grating and wherein θ_{2max} is preselected such that said diffracted beam on said second grating is diffracted from said second at maximum intensity and $\alpha = \theta_{1max} + \theta_{2max}$.



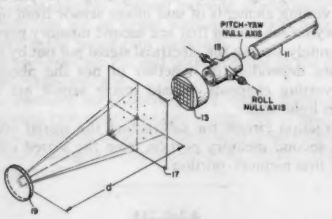
whereby any small deviations of said input beam produces a large variance in said intensity of said beam diffracted from said second grating.

4,330,212

TRIAXIS LASER ALIGNMENT SYSTEM AND METHOD

John M. Miller, Huntington Station, N.Y., assignor to Grumman Aerospace Corporation, Bethpage, N.Y.

Continuation of Ser. No. 970,651, Dec. 18, 1978, abandoned.
This application Oct. 23, 1980, Ser. No. 200,003
Int. Cl.³ G01B 9/02, 11/27
U.S. Cl. 356—354 12 Claims



1. A method of determing the angular displacement of one or more members relative to a reference plane, said method comprising the steps of:

generating reference lines on a target representative of the reference plane

diffracting a beam of coherent light from the reference plane through the target by projecting same through a transmission ruling having a known frequency and through a small opening in the target;

attaching a reflective surface to the one or more members to be receptive of the diffracted beam from the small opening through the target whereby said diffracted beam impacts the reflective surface on the member whose orientation is to be determined;

reflecting said diffracted beam by said reflective surface on the face of the target; and

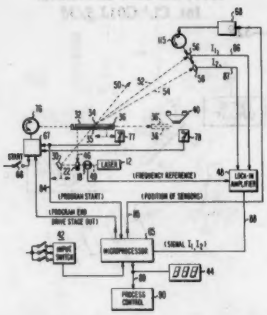
determining from the image of the reflected diffracted beam on the face of the target the displacement of the member from the reference plane by measuring the displacement of said diffraction pattern from target reference lines.

4,330,213

OPTICAL LINE WIDTH MEASURING APPARATUS AND METHOD

Hans P. Kleinknecht, Bergdietikon, and Heinrich Meier, Urdorf, both of Switzerland, assignors to RCA Corporation, New York, N.Y.

Filed Feb. 14, 1980, Ser. No. 121,529
Int. Cl.³ G01B 9/02, 11/02
U.S. Cl. 356—355 15 Claims



1. In an apparatus for optically testing the lateral dimensions of a diffraction pattern of material disposed on a substrate, said diffraction pattern comprised of a planar array of spaced strips of material having a strip width a and a periodicity d, said apparatus including means for exposing said diffraction pattern to a beam of monochromatic light to diffract said beam into diffracted beams of various orders, detector means including detectors for measuring the intensity of at least two of the diffracted beams to obtain at least two intensity signals and means responsive to said intensity signals for determining the width a of said strips, wherein the improvement comprises:

means for moving said detectors to respective positions in a plane to intercept said diffracted beams, said intercept plane being orthogonal to said diffraction array strips;

wherein said detector moving means includes a pair of pivotal arms having a respective one of said detectors connected at one end of each arm, said arms being pivotally connected for rotation about an axis lying in an extension of and parallel to said diffraction array strips;

further including means to control the spacing between said detectors to a predetermined value corresponding to the periodicity d; and wherein said detector spacing means includes:

a pin on each of said pivotal arms;

a guide member including means for positioning said guide member in a direction parallel to the plane of said diffraction array strips and perpendicular to said pivotal arms axis; and

a slot in said guide member extending orthogonally to the direction of movement of said guide member and adapted to receive each of said pins to effect pivotal movement of said arms as said guide member is moved, the distance between each pin and the pivotal axis of said arms and the position of said guide member defining thereby the respective positions of said detectors.

4,330,214

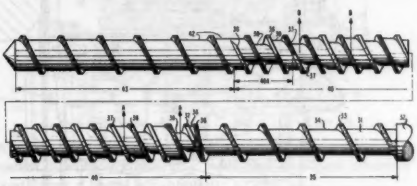
PLASTICIZING SCREW

William H. Willert, N. Plainfield, N.J., assignor to W. H. Willert, Inc., North Plainfield, N.J.

Filed Feb. 19, 1980, Ser. No. 122,414
Int. Cl.³ B29B 1/06
U.S. Cl. 366—78 8 Claims

3. An extruder screw having a feeding section and a plasticizing section, comprising:

(a) a first flight which extends through the feeding and plasticizing sections;
(b) a second flight which extends through the plasticizing section;
(c) a feeding channel defined by the leading and trailing edges of the first flight in the feeding section;
(d) a solids channel extending through said plasticizing section, defined by the trailing edge of one of said flights which has a predetermined diameter and by the leading edge of the other of said flights which has a diameter which is less than the diameter of said one of said flights, said solids channel having an initial depth which is greater



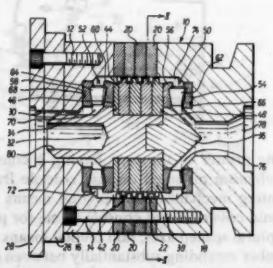
than the depth of the feed channel and said solids channel is in communication with said feed channel to receive solid material therefrom; and
(e) a melt channel extending through said plasticizing section, defined by the leading edge of one of said flights which has a predetermined diameter and by the trailing edge of the other of said flights which has a diameter which is less than the diameter of said one of said flights, said melt channel having an initial depth which is not greater than the depth of the feed channel and said melt channel is adapted to receive plasticized material passing over said one of said flights from the solids channel.

4,330,215

MIXING DEVICE

George M. Gale, Shrewsbury, England, assignor to Rubber & Plastics Research Assoc of GB, England

Filed May 1, 1980, Ser. No. 145,826
Claims priority, application United Kingdom, May 3, 1979, 7915508
Int. Cl.³ B29B 1/06; B01F 7/02
U.S. Cl. 366—99 4 Claims



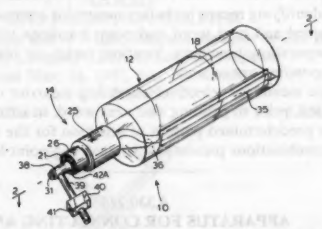
1. A mixing device comprising:
a generally cylindrical inner member;
a generally cylindrical outer member;
means coaxially mounting said inner and outer members;
means enabling one of said inner and outer members to be rotated relative to the other about a common axis;
a plurality of first sets of spaced teeth carried by the inner periphery of the outer member;
a plurality of second sets of spaced teeth carried by the outer periphery of the inner member;
each of said sets of teeth having its teeth disposed symmetrically about said common axis in a respective plane perpendicular to said axis;
each set of teeth on one of said members overlapping radially the teeth of at least one adjacent set on the other of said members;
a pair of roller bearings disposed between said two members, said roller bearings maintaining a predetermined axial separation between adjacent sets of teeth on the two members;
each roller bearing including a plurality of radially extending tapered rollers disposed between two raceways connected to said two members, respectively, the rollers defining a plurality of clearance passages therebetween;
means defining a first chamber located radially inwardly of one of said roller bearings and connected to an inlet of the mixing device;
means defining a second chamber located radially inwardly of the other of said roller bearings and connected to an outlet of the mixing device;
two further chambers located radially outwardly of said two roller bearings, respectively; and
means defining an annular space containing the overlapping teeth and interconnecting said two further chambers, whereby, in use, material passing through the mixing device has to pass through said one of the roller bearing, through the space occupied by the relatively rotating, overlapping teeth and through the other roller bearing.

4,330,216

GRAVITY-INDUCED STIRRING DEVICE FOR ROTATING LIQUID CONTAINERS

Luther R. Johnson, Thousand Oaks, Calif., assignor to Becton, Dickinson and Company, Paramus, N.J.

Filed Nov. 21, 1980, Ser. No. 208,979
Int. Cl.³ B01F 9/08
U.S. Cl. 366—222 12 Claims



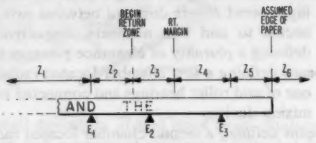
10. A rotatable liquid container assembly with a gravity-induced stirring mechanism comprising:
a liquid container adapted to be rotated with liquid therein;
movable stirring means positioned inside said container for imparting stirring movement to said liquid;
means associated with said container and said stirring means for moving said stirring means with said container for only a portion of a revolution of said container when rotating and for permitting increasing gravitational force thereon due to rotation to discontinue the movement of said stirring means and cause a gravitationally-induced rotation of the stirring means in a counterdirection to that of said rotating container whereby liquid placed inside said container is adapted to be stirred.

4,330,217

LINE ADJUSTMENT APPARATUS FOR A TYPEWRITER

Dennis M. Churgovich; William F. Joest, III; William R. McCray, and Edward V. Rutkowski, Jr., all of Lexington, Ky., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Sep. 27, 1979, Ser. No. 79,628
Int. Cl.³ B41J *5/30*
U.S. Cl. 400—64 **5 Claims**



1. For use in a typewriter of the kind that can print a string of text that is accessed from storage in coded form, such printing occurring along lines having a desired end point established by a stored right margin position code, a system for inserting carrier returns to control line length during playback from storage, such system comprising:

means for maintaining a position count indicative of the current line location as printing is performed;

means for storing a line location code which corresponds to the end point of the last word that was printed from the text string;

means for identifying the end point of the next word of the stored text string;

means for accessing codes for the next word of the text string and for calculating based on the shift in print position represented by such codes, the potential end point location for printing the word on the present line;

means for establishing zones extending along the print line including a fixed length return zone before the right margin and at least one zone on either side of said return zone, said establishing means including means for storing codes representing at least five zone separation boundary locations;

means for identifying said last word and said next word end point locations with respective corresponding zones, said identifying means including means for comparing said last word and next word end point locations with said zone separation boundary location codes to identify corresponding zones; and

logic means for selectively inserting a carrier return operation, prior to printing said next word, in accordance with a predetermined pattern of selection for the various zone combinations presentable by said end point locations.

4,330,218

APPARATUS FOR CONNECTING AND DISCONNECTING A MOTOR AND A PRINT ELEMENT BY PIVOTING A RIBBON CARTRIDGE

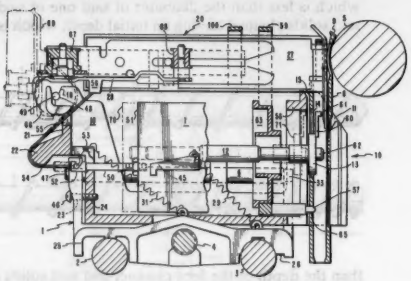
Adolph B. Habich, and Ronald E. Hunt, both of Austin, Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 29, 1979, Ser. No. 53,648
The portion of the term of this patent subsequent to Jul. 14, 1998, has been disclaimed.
Int. Cl.³ B41J *1/30*
U.S. Cl. 400—144.2 **7 Claims**

1. Apparatus for engaging and disengaging a selection motor drive hub and a daisy wheel print element upon pivoting of a ribbon cartridge during a print element chage operation, for printer servicing, etc., said apparatus comprising in combination:

(a) means for supporting said ribbon cartridge for pivoting between positions such that an included ribbon is (1) out of interfering relationship with said print element, and (2) in printing relationship with said print element;

(b) means for supporting said means for supporting said ribbon cartridge and a selection motor having said hub connected thereto for independent translation in the same direction toward and away from said print element, said selection motor being translatable for causing engagement and disengagement of said hub and said print element; and



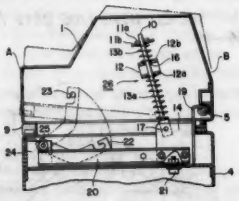
(c) means for connecting said selection motor and said ribbon cartridge for causing said hub to be translated toward and away from said print element upon a pivoting of said ribbon cartridge for positioning said ribbon in printing relationship and non-interfering relationship with said print element.

4,330,219

UPPER COVER FOR LINE PRINTER

Masao Miyasaka, and Tsuneki Kobayashi, both of Katsuta, Japan, assignors to Hitachi Koki Company, Limited, Tokyo, Japan

Filed Aug. 1, 1980, Ser. No. 174,422
Claims priority, application Japan, Aug. 4, 1979, 54-99732
Int. Cl.³ B41J *29/02, 29/08*
U.S. Cl. 400—690.4 **5 Claims**



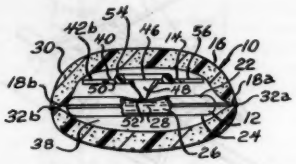
1. In a line printer of the type having a console frame, a printing mechanism mounted on said console frame, a cover for said printing mechanism and pivotal means for pivotally supporting said cover on said console frame for pivotal movement about plural spaced axes, said pivotal means comprising a support member extending substantially between opposite first and second edges of said cover, first pivot means pivotally connecting said first edge of said cover to one end of said support member, means detachably connecting said one end of said support member to said frame, second pivot means pivotally connecting the opposite end of said support member to said frame, latch means pivoted on said second pivot means and detachably connected to said cover whereby when said latch means is disconnected from said cover and said one end of said support member is connected to said frame said cover can be pivoted about said first pivot means and when said one end of said support member is disconnected from said frame and said latch means is connected to said cover said cover can be pivoted about said second pivot means.

4,330,220

SCRUB SPONGE

Charles H. Schaar, Lake Zurich; Nicholas A. Marra, Glen Ellyn; William J. Dunn, Libertyville, and Frank K. Villari, Oak Park, all of Ill., assignors to The Kendall Company, Boston, Mass.

Filed Jun. 12, 1980, Ser. No. 158,743
Int. Cl.³ B05C 17/00; A61M 35/00
U.S. Cl. 401—134 18 Claims



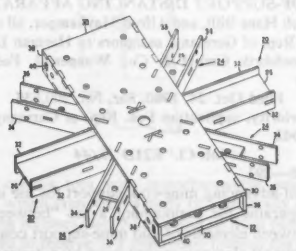
1. A scrub sponge, comprising:
a packet having a rupturable wall and a closed chamber containing a liquid scrub agent;
a cover of foam material having a cavity to receive said packet and completely enclosing said packet; and
a puncture member intermediate said cover and the rupturable wall, with the puncture member having a projection facing toward the puncturable wall such that the projection pierces the puncturable wall when the puncture member is pressed toward said packet to release said scrub agent into the cover, said projection being located adjacent a longitudinal central portion of the puncture member, in which the puncture member has a pair of laterally extending wings adjacent opposed ends of the puncture member, and in which the puncture member has a pair of longitudinal extensions connecting said wings and said central portion of the puncture member.

4,330,221

HIGH STABILITY STRUCTURAL JOINT, DEVICE AND METHOD

James E. Stumm, 4983 Southcrest Ave., San Diego, Calif. 92110

Filed Oct. 12, 1979, Ser. No. 84,106
Int. Cl.³ F16B 1/00
U.S. Cl. 403—218 8 Claims



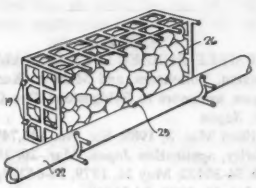
1. A structural joint of the type having structural members intersecting substantially at a common point, said joint comprising:
a planar plate shaped to form legs extending in the direction of each of said intersecting structural members;
a plurality of cap strips, one of said cap strips located at each longitudinal edge of each of said planar plate legs, said cap strips disposed along said leg edge to form upstanding substantially right angularly disposed caps that form each of said planar plate legs into a channel shaped beam;
a second planar plate disposed above said first mentioned plate and fastened to said cap strips to form a plurality of intersecting box-beams.

4,330,222

IRRIGATION MEANS AND METHOD

Heinz E. O. Klein, 11 Kraegen St., Alice Springs, Northern Territory, Australia

Filed Apr. 17, 1980, Ser. No. 141,108
Claims priority, application Australia, Apr. 19, 1979, PD8472
Int. Cl.³ E02B 13/00
U.S. Cl. 405—48 4 Claims



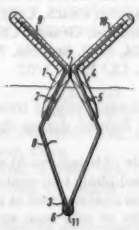
1. A method of irrigation comprising the steps of
forming at least one outlet aperture in a wall of a water distribution pipe,
forming at least one strainer box from a unitary moulding having a plurality of foldable walls at least some of which comprise strands intersecting at cross-over points to form an open mesh, but the strands of each of two pairs of strands being spaced apart to define a pair of open-ended slots, the two slots extending into opposite walls of the box and being of such size and shape as to locate the box over the pipe,
folding the walls of the box so as to thereby effect the location of the box over the pipe,
placing particulate material into the box and folding a top wall of the box over the opposite walls and thereby retaining the box to the pipe with the particulate material surrounding a portion of the pipe containing the outlet aperture, and
distributing irrigation water through the pipe and the aperture therein into the box to percolate through the particulate material.

4,330,223

ANTI-POLLUTION BARRIER

Michael G. Webb, Isle of Wight, England, assignor to The British Petroleum Company Limited, London, England

Filed Mar. 16, 1981, Ser. No. 244,516
Int. Cl.³ E02B 15/04
U.S. Cl. 405—63 6 Claims



1. A barrier for impeding the spread of oil spilt on water comprising:
(a) two Z-shaped members in cross-section each of which comprises an angled buoyant rigid element attached to an angled stiffener to form a Z-shape in cross-section,
(b) the Z-shaped members being arranged so that each is a mirror image of the other with the ends of the angled stiffeners remote from the rigid elements being rotatably

connected so that the Z-shaped members are capable of being bent back against each other and releasably joined at the buoyant rigid elements, with part of each angled buoyant rigid section projecting above the join and the parts projecting above the join being at an angle to each other,

(c) a flexible membrane passing around the angled stiffeners enclosing the area between the stiffeners, each end of the membrane being attached to one of the angled buoyant rigid elements.

4,330,224

COLLAPSIBLE RUBBER DAM INSTALLATION

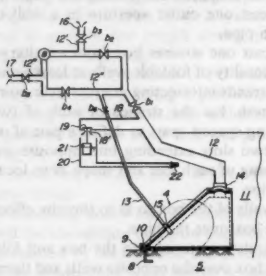
Tateo Muramatsu, Yokohama, and Mamoru Kurihara, Tokyo, both of Japan, assignors to Bridgestone Tire Company Limited, Tokyo, Japan

Filed Mar. 3, 1980, Ser. No. 126,749

Claims priority, application Japan, Mar. 20, 1979, 54-33031; Mar. 28, 1979, 54-35422; May 24, 1979, 54-64299; Jul. 13, 1979, 54-95625[U]; Jul. 31, 1979, 54-96719

Int. Cl.³ E02B *7/02*

U.S. Cl. 405—115 **8 Claims**



1. In a collapsible rubber dam installation comprising a rubber dam built across a watercourse such as a river or the like and operative to be raised by supplying fluid into the rubber dam and to be collapsed by discharging the fluid filled therein, the improvement comprising; one end of a fluid supply and discharge conduit being connected to the inside of said rubber dam at a position which is higher than at least a level of drainage collected therein, whereas the other end of said conduit is extended substantially upwardly with an ascending inclination.

4,330,225

SYSTEM FOR ENTRENCHING SUBMERGED ELONGATED STRUCTURES

James S. Glasgow, Huntington Beach, Calif., assignor to Santa Fe International Corporation, Orange, Calif.

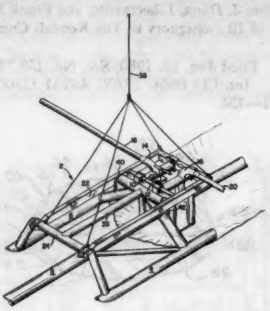
Filed Sep. 24, 1979, Ser. No. 78,184

Int. Cl.³ E02F *5/02*

U.S. Cl. 405—160 **76 Claims**

1. Apparatus for use in excavating a trench in a sea bottom and for removing spoil formed during the excavation, said apparatus comprising:

a base structure capable of being towed along a sea bottom, said base structure including: two pontoons, each having a sufficiently high mass concentrated at its front end so that the center of gravity of said base structure is approximately at the longitudinal center of said base structure when said base structure is out of water; a frame for disposition over the area in which the trench is to be formed; tow line connecting means arranged at the forward section of said base structure; fluid jet excavating means mounted on said frame and located adjacent to the rear end of said base structure; spoil removal means mounted on said frame and located aft of said fluid jet excavating means; said spoil removal means including at least one eductor for sucking up spoil excavated by said fluid jet excavating means and a discharge tube coupled to an output end of said eductor, said discharge tube extending



past the side of said base structure by approximately a distance L where

$$L \geq \sqrt{20\ wd}$$

where w equals the average width of the trench to be excavated and d equals the depth of the trench to be excavated; and said base structure having its center of buoyancy and center of gravity located so that said base structure rides along substantially undisturbed soil on the sea bottom during the excavating operation; and

a towing vessel capable of moving along the water surface and having towing means coupled to said tow line connecting means so that said towing vessel can tow said base structure along the sea bottom.

4,330,226

ROOF-SUPPORT DISTANCING APPARATUS

Josef Welzel; Hans Büll, and Alfred Maykemper, all of Wuppertal, Fed. Rep. of Germany, assignors to Herman Hemscheidt Maschinenfabrik GmbH & Co., Wuppertal, Fed. Rep. of Germany

Filed Oct. 24, 1980, Ser. No. 200,535

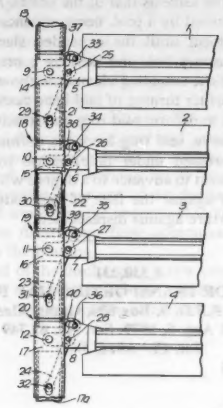
Claims priority, application Fed. Rep. of Germany, Oct. 24, 1979, 2942943

Int. Cl.³ E21D *15/44*

U.S. Cl. 405—291 **8 Claims**

1. In a self-advancing mine-roof support for use in longwall mining, apparatus for maintaining a set "between-centres" distance between elements of said mine-support comprising: at least two support elements spaced apart by a desired distance, an abutment arranged, in use, to extend substantially parallel to the longwall face, respective connecting means on said support elements pivotally connected to respective portions of said abutment whereby said elements are able to pivot to a limited extent relative to said abutment, the connecting means of at least one support element being constructed as a drive means and said abutment portions being arranged end-to-end and being adapted for limited axial displacement with respect to each other whereby the length of said abutment can be varied, and a guide lever pivoted at one place thereon to the connecting means of at least one support element and pivoted at a second place thereon to the abutment portion connected to an adjacent support element whereby said two places on said

guide lever where pivotal connections are provided and the place at which the respective connecting means of the at least



one support element are connected to the respective abutment portion lie at the corners of a triangle.

4,330,227
CUTTING TOOL WITH INTERCHANGEABLE INSERT-HOLDING CARTRIDGES

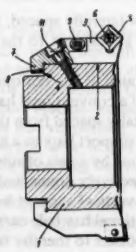
Pierre Raye, Prangins; Henri Jaquiery, Nyon, and Hermann Gehri, Prangins, all of Switzerland, assignors to Stellram S.A., Nyon, Switzerland

Filed Jun. 19, 1980, Ser. No. 179,443

Claims priority, application Switzerland, Aug. 31, 1979, 7896/79

Int. Cl.³ B26D *1/12*

U.S. Cl. 407—36 **9 Claims**



1. In a cutting tool with interchangeable insert-holding cartridges, which comprises a body of a generally cylindrical shape having recesses distributed about its front peripheral end and intended to receive in a removable manner the cartridges, each cartridge comprising at its front end a cutting bit; the improvement in which said body of the tool comprises a peripheral supporting surface which is directed toward the rear end of said body and each cartridge is provided at its rear end with a back portion having a supporting face directed toward the front of the cartridge and intended to come, in a service position, into abutment against said support surface of said body, and fixing means for each cartridge in its recess provided in said body comprising a screw cooperating with an opening traversing the cartridge and with a threading provided in the body, the axis of said opening and of said threading being situated in a plane oblique to the plane of the supporting surface and directed forwardly inwardly, in such a manner that in screwed service position, said screw keeps the supporting face of the back portion of the cartridge against the supporting surface of the body of the tool.

4,330,228
DRILLING AND TAPPING JIG FOR SKIS

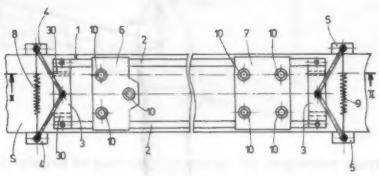
Jean J. A. Beyl, Nevers, France, assignor to Look, Nevers, France

Filed Dec. 10, 1979, Ser. No. 101,712

Claims priority, application France, Dec. 18, 1978, 78 35509

Int. Cl.³ B23B *49/00*

U.S. Cl. 408—112 **11 Claims**



1. Apparatus for drilling and tapping in a ski holes of predetermined depth for receiving therein screws necessary for fixing a safety ski binding to the ski, said apparatus comprising:

a jig including an elastically deformable frame, releasable means on said frame for securing said jig to the ski during a drilling and tapping operation, and a plurality of guide sockets carried on said frame relatively spaced apart in accordance with the spacing of screw passage holes provided in the ski binding, each of said guide sockets including a top face, a bottom face, and an axial bore of predetermined diameter defined through said socket between said top and bottom faces thereof; and

a bit and a tap, each including a body of substantially said predetermined diameter for guided entry into said guide socket bore during a drilling and tapping operation, a tip at one end of said body, and a shoulder spaced from said tip axially along said body and adapted to bear against the top face of said guide socket during a drilling and tapping operation, the spacing between the end of said tip and said shoulder of each said bit and tap being substantially equal to the sum of the axial length of said guide sockets and the predetermined depth of the holes to be drilled and tapped so that when said body of the bit or tap is fully inserted into the bore of one of said guide sockets whereby said shoulder abuts the socket top face, the eastic deformability of said frame enables the socket lower face to bear against the ski such that a hole thereby prepared in the ski is limited to the predetrmined depth.

4,330,229
DRILL BIT

Frederic G. Croydon, Portland, Oreg., assignor to Omark Industries, Inc., Portland, Oreg.

Filed Dec. 4, 1980, Ser. No. 212,896

Int. Cl.³ B23B *51/00*

U.S. Cl. 408—212 **5 Claims**

1. A drill bit comprising an elongate body having a working end and helical flutes formed therein extending from said working end toward the opposite end of said body, said working end being formed with a central work-engaging point, at least a pair of slitting spurs spaced radially outwardly from said point adjacent outer edge margins of said body, and a convexly contoured body portion interconnecting said point and a spur and intersecting a flute in said body to define a sharpened cutting edge intermediate said point and spur, a spur having a sharpened arcuate slitting edge directed longitudinally out-

wardly from said body in the same direction as said point with a leading portion of said slitting edge which first engages the

work on rotation of the drill sloping toward the opposite end of said body on progressing in the direction of rotation.

4,330,230

ANCHOR BOLT ASSEMBLY

Louis N. Giannuzzi, 4 Shelter Dr., Cos Cob, Conn. 06807

Continuation-in-part of Ser. No. 135,858, Mar. 31, 1980, which is a division of Ser. No. 930,741, Aug. 3, 1978, Pat. No. 4,195,547. This application May 21, 1980, Ser. No. 151,838

Int. Cl.³ F16B *13/06*

U.S. Cl. 411—55 **6 Claims**

1. An anchor bolt assembly adapted to fasten a fixture having a hole therein against the surface of masonry having a hole drilled therein, said assembly being insertable through the fixture hole into the masonry hole and comprising:

A a threaded bolt having an expander element at the lower end thereof;

B an expandable sleeve through which said bolt extends, said sleeve being formed of a tube having longitudinal slots therein to define deflectable tines extending from an end collar, an axial advance of said bolt causing the expander element to force its way into the tines of the sleeve to effect expansion thereof against the wall of the masonry hole;

C an actuating element defined by an internally-threaded tube receiving the upper end of the bolt and provided at its upper end with an enlarged head which lies outside of said fixture; and

D means to tightly secure said fixture against displacement defined by a deformable normally rigid ring on said bolt interposed between the lower end of the actuating element and the collar of the sleeve, the diameter of the ring being substantially the same as that of the collar, the bolt when said head is turned by a tool, being advanced toward the actuating element until the expanded sleeve is locked within the masonry hole and the ring is pressed between the collar and the actuating element without deformation of the ring, further turning of said head causing said actuating element to deform said ring and to advance toward the locked sleeve, said ring having a normal axial length which is shortened under deformation to permit said actuating element to advance to a degree which causes the head to press against the face of said fixture to tightly secure said fixture against displacement.

4,330,231

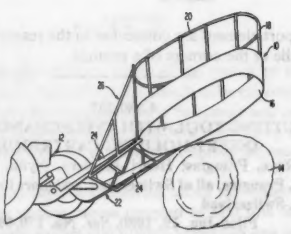
ADAPTER FOR TRANSPORTING HAY FEEDERS

James L. Brewer, R.F.D. 3, Box 534, Grant, Ala. 35747

Filed Aug. 6, 1979, Ser. No. 63,749

Int. Cl.³ A01K *5/00*

U.S. Cl. 414—24.5 **5 Claims**



1. Apparatus for adapting a conventional hay bale feeder for transportation by a conventional hay bale carrier having forks, comprising:

a frame having a pair of laterally spaced, substantially vertical support bars for attachment to the exterior of a hay bale feeder;

at least one pocket located at the bottom of said frame for receiving the forks of a conventional hay bale carrier; and

support means horizontally spaced from the points of attachment of said vertical support bars to a hay bale feeder and connected to said frame by a pair of substantially horizontal support bars respectively connected at one end to the bottom ends of said vertical support bars, for contacting the forks of a conventional hay bale carrier when the forks are inserted in said pocket to thereby receive some of the stress imparted to the frame when a hay bale feeder is transported by means of the bale carrier.

4,330,232

GRAIN BIN AND TRUCK LOADING AND UNLOADING SYSTEM

Jay L. McClaren, Dassel, Minn. 55325

Continuation of Ser. No. 921,722, Jul. 3, 1978, abandoned. This application Sep. 29, 1980, Ser. No. 191,610

Int. Cl.³ B65G *65/22, 65/28*

U.S. Cl. 414—267 **7 Claims**

1. A grain handling apparatus for loading and unloading grain bins and receptacles and the like, comprising

a grain receiving screw conveyor and a grain discharging screw conveyor, said conveyors being inclined at a steep angle to the horizontal said conveyors having inner ends adjacent each other and also having outer ends, the outer end of the grain receiving screw conveyor having a hopper thereon,

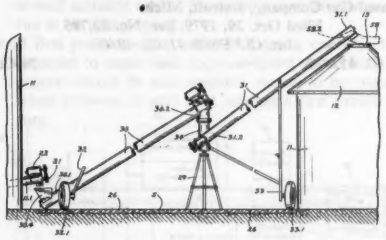
a stationary center support on the ground and beneath the inner ends of both of said conveyors,

an enclosed transfer housing above said center support and having upper and lower upright peripheral wall sections with rotatable connector means therebetween maintaining the wall sections in substantial alignment with each other and permitting rotation of said wall sections relative to each other and about an upright rotation axis extending through the housing,

rotatable mounting means beneath the transfer housing and secured to the center support and permitting turning of the lower wall section about an upright turning axis,

the inner end of the receiving screw conveyor being disposed above the inner end of the discharging screw conveyor and traversing the upper wall section of the transfer housing in fixed grain flow communication to deliver grain into the housing,

the inner end of the discharging screw conveyor traversing the lower wall section of the transfer housing in fixed grain flow communication to receive grain therefrom,



a first pair of ground travel support wheels in tandem relation to each other adjacent the outer end of the receiving screw conveyor, attaching means on the receiving screw conveyor and mounting said support wheels to locate the outer end of the receiving screw conveyor and the hopper adjacent ground level, the support wheels being oriented to follow a circular track around the stationary support, and

a second pair of ground travel support wheels in tandem relation to each other beneath the discharging screw conveyor, rigid bracket means affixed to the discharging screw conveyor intermediate the inner and outer ends thereof, and said bracket means mounting said second support wheels and supporting the outer end of the discharging conveyor at a height significantly above the inner end of the receiving conveyor, the second support wheels being oriented to follow the circular track around the stationary support, the outer end of the discharging screw conveyor projecting significantly beyond the bracket means.

4,330,233

FLOW CONTROL APPARATUS FOR SILAGE UNLOADER

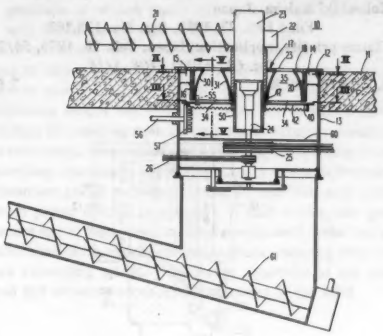
Richard L. Weaver, R.D. 4, Myerstown, Pa. 17067

Filed Aug. 12, 1980, Ser. No. 177,493

Int. Cl.³ B65G *65/46*

U.S. Cl. 414—310 **13 Claims**

1. In silage unloader apparatus of the bottom unloader type, wherein a generally radially disposed auger means is provided for rotation on its own axis and for arcuate sweeping motion for delivering silage toward a generally centrally located rotatable discharge passageway member, wherein the discharge passageway member is generally vertically disposed and is provided with permanently open generally vertically disposed passage means, the improvement comprising a closeable opening member disposed generally vertically adjacent said passage means, said opening member having both perforate and imperforate portions and including means mounting said opening member for movement relative to said passage means for selective positioning of said perforate portion(s) or imperforate



portion(s) relative to said passage means for respective corresponding opening and closing of said passage means.

4,330,234

ROTOR TIP CLEARANCE CONTROL APPARATUS FOR A GAS TURBINE ENGINE

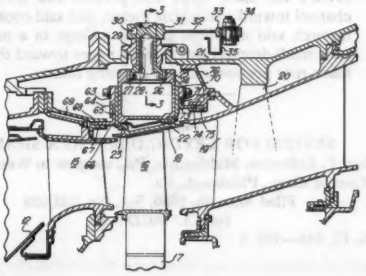
Rowan H. Colley, Sunnyhill, England, assignor to Rolls-Royce Limited, London, England

Filed Jan. 21, 1980, Ser. No. 115,555

Claims priority, application United Kingdom, Feb. 20, 1979, 7905999

Int. Cl.³ F01D *11/08*

U.S. Cl. 415—171 **13 Claims**



1. Rotor tip clearance control apparatus for a gas turbine engine comprising:

static structure;

an annular shroud member movable axially and radially relative to said static structure, said shroud member having an internal frusto-conical face;

a rotor having outer extremities cooperating with said frusto-conical face to define a small clearance therewith;

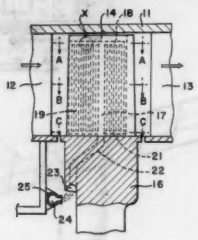
a plurality of rotatable eccentrics supporting said annular shroud member from said static structure, said plurality of eccentrics being rotatable on axes substantially radial of said annular shroud member; and

means to rotate said eccentrics and move said shroud member axially whereby said clearance between the extremities of said rotor and said shroud is controlled in a predetermined manner.

4,330,235
COOLING APPARATUS FOR GAS TURBINE BLADES

Tatsuo Araki, Tokyo, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Filed Feb. 27, 1980, Ser. No. 125,103
Claims priority, application Japan, Feb. 28, 1979, 54/23199
Int. Cl.³ F01D 5/08, 5/18
U.S. Cl. 416—96 R 7 Claims

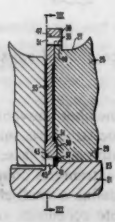


1. In a blade for a gas turbine, apparatus for cooling said blade during rotation of the blade comprising:
- liquid-flow coolant passage means travelling substantially longitudinally within said blade and adapted to be fed with coolant in a liquid state at a first blade root portion;
- nozzle means provided within said blade at an outer end portion thereof for converting coolant flow in the liquid state to mist flow;
- channel means for communicating said liquid-flow coolant passage means with said nozzle means;
- mist-flow coolant passage means fed by said nozzle means and travelling substantially longitudinally within said blade toward a second blade root portion; and
- draining means for discharging waste coolant from said second blade root portion;
- wherein, said coolant flows in the liquid state under centrifugal force through said liquid-flow coolant passage means toward the blade outer end portion and through said channel toward said nozzle means, and said coolant flows through said mist-flow coolant passage in a mixture of very small droplets and gaseous vapor toward the second blade root portion and said draining means.

4,330,236
SYSTEM FOR KEYING DISCS TO A SHAFT

Albert F. LeBreton, Middletown, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Mar. 28, 1980, Ser. No. 135,036
Int. Cl.³ F01D 5/06
U.S. Cl. 416—198 A 5 Claims

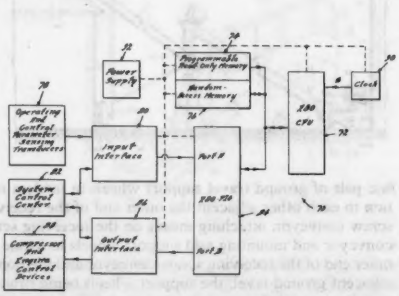


1. A rotor for a fluid machine, said rotor comprising:
- a shaft having a plurality of circumferential steps which ascend from at least one end thereof;
- a plurality of blade discs each having a bore which fits a particular circumferential step;
- a plurality of face discs, each face disc being associated with a blade disc and having a bore which fits the same particular circumferential step as the associated blade disc;
- a plurality of first keys disposed at the juncture of the circumferential steps and the bore of the face discs, the circumferential steps and face disc bores having aligned grooves forming an opening for receiving the first keys; and
- a plurality of second keys disposed to extend between the blade discs and the associated face dics, the second keys being displaced radially outwardly from the bore of the discs to a location in the discs where the stresses are lower, the discs having grooves in this location which form openings for receiving the second keys to prevent relative rotation between the blade disc and shaft.

4,330,237
COMPRESSOR AND ENGINE EFFICIENCY SYSTEM AND METHOD

Husam Battah, Marysville, Mich., assignor to Michigan Consolidated Gas Company, Detroit, Mich.

Filed Oct. 29, 1979, Ser. No. 88,785
Int. Cl.³ F04B 41/06, 49/00
U.S. Cl. 417—2 24 Claims



1. A method of controlling a gas compressor and engine unit, the steps comprising:
- (a) sensing the values of a set of operating and control parameters at determinable intervals;
- (b) determining an energy quotient for said unit from said operating and control parameters;
- (c) adjusting at least one control parameter in response to a change in said energy quotient, so that said energy quotient for said gas compressor and engine unit is substantially maximized.

24. A method of controlling at least two gas compressor and engine units combined in series for multiple-stage operation, the steps comprising:
- (a) adjusting an engine speed and a compressor loading for each of said units so that an equivalent capacity of gas flow from each compressor is achieved; and
- (b) readjusting said engine speeds and said compressor loadings so that a predeterminable inter-stage pressure is maintained.

4,330,238
AUTOMATIC ACTUATOR FOR VARIABLE SPEED PUMP

Clark R. Hoffman, Oxnard, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Mar. 4, 1980, Ser. No. 127,020
Int. Cl.³ F04B 49/00
U.S. Cl. 417—19 13 Claims

1. An automatic speed-control actuator system for variable-speed fluid pumps operable to change the pump speed for

preventing unacceptable low pressures at a pump inlet and unacceptable high pressures at a pump outlet, comprising:

a. a pump means having an inlet and an outlet;

b. a drive means connected to said pump means for driving said pump means;

c. a speed adjusting means in conjuction with said drive means for varying the speed of said drive means;

d. an actuator means connected to said speed adjusting means and being operable to vary said speed adjusting means for any of increasing, decreasing, and idling the speed of said drive means and thus the flow of liquid through said pump means;

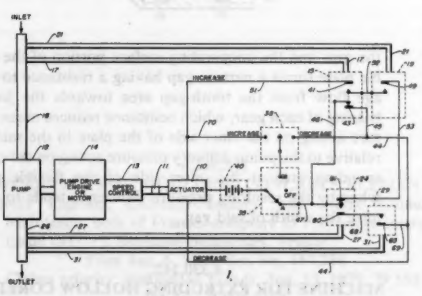
e. a power source;

f. switching means sensitive to and actuated by present pressures at the inlet and at the outlet of said pump means; said switching means comprising;

a circuit including first, second, third, and fourth pressure-actuated switches;

said pressure-actuated switches being arranged in said circuit such that in their normal unactuated positions a decrease-speed signal is applied from said power source to said actuator means for causing said drive means to run at an idling speed;

said first pressure-actuated switch being operable to be actuated to cause said decrease-speed signal from said power source to said actuator means to be removed when pressure at said inlet reaches a first preset pressure;



said second pressure-actuated switch being operable to be actuated when pressure at said inlet reaches a second preset pressure, which is greater than said first preset pressure, to cause an increase-speed signal from said power source to be applied to said actuator means for increasing the drive means speed at a slow rate;

said third pressure-actuated switch being operable to be actuated to remove said increase-speed signal applied to said actuator from said power source when the outlet pressure increases to a desired third preset pressure, which is greater than said second preset pressure, allowing said pump means to continue to operate and discharge fluid at the third preset pressure as long as fluid flow to said inlet is unchanged;

said fourth pressure-actuated switch being actuated by an increase in pressure at said outlet to a fourth preset pressure causing a decrease-speed signal from said power source to be applied to said actuator means and in turn cause a decrease in pressure at said outlet until said fourth pressure-actuated switch deactuates; a decrease in pressure below said third present pressure causing said third pressure-actuated switch to deactivate and again apply an increase-speed signal to said actuator means, thus causing said actuator control system to modulate between said third and fourth preset pressures by control of said third and fourth pressure-actuated switches;

said first pressure-actuated switch being deactivated when an insufficiency of fluid at said inlet causes a pressure drop below said first preset pressure thus preventing any increase-speed signal from being applied to said actuator means and causing a decrease-speed signal to be applied until the pressure rises above said first preset pressure at which point said actuator control system will modulate on inlet pressure;

g. said switching means connected to said actuator means and to said power source for applying signals from said power source to said actuator means to vary said speed adjusting means and thereby cause said pump means to change its pumping rate in response to pressure conditions at said pump means inlet and outlet for maintaining normal pumping operations under pressure conditions between a minimum preset suction pressure at said inlet and a maximum preset discharge pressure at said outlet; said pump means speed being automatically regulated under varying inlet conditions to achieve a maximum pumping rate while not exceeding selected discharge pressures at the outlet and not creating an excessive vacuum at the inlet.

4,330,239

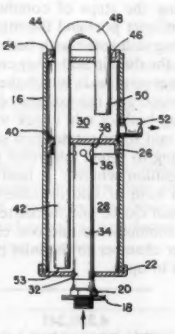
COMPRESSOR MUFFLER

Edwin L. Gannaway, Adrian, Mich., assignor to Tecumseh Products Company, Tecumseh, Mich.

Filed Oct. 10, 1979, Ser. No. 83,350

Int. Cl.[3] **F04B** *39/00;* **F01N** *1/08*

U.S. Cl. 417—312 **15 Claims**

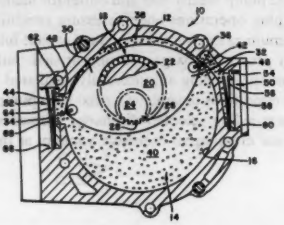


1. In combination with a hermetic gas compressor having a housing and having a given pumping frequency at its outlet, a muffler mounted within the compressor housing comprising: a housing having an inlet in fluid communication with the compressor outlet, at least two chambers separated by a partition wall, an inlet tube in one of said chambers adapted to permit gas flow into said one of said chambers, said inlet tube being in fluid communication with the housing inlet, an elongated tube having an inlet end in said one chamber and an outlet end the other of said chambers adapted to permit gas flow from said one chamber to said other chamber, an intermediate portion of said elongated tube extending out of said other chamber and returning to said other chamber and being disposed entirely outside said one chamber and said other chamber, an outlet in said other chamber, said muffler being tuned such that its sound attenuation and impedance characteristics are each substantially zero at the compressor pumping frequency and the attenuation increasing at frequencies above the pumping frequency.

4,330,240
ROTARY COMPRESSOR WITH COMMUNICATION BETWEEN CHAMBERS TO PROVIDE SUPERCHARGING

Ralph G. Eslinger, Elyria, Ohio, assignor to The Bendix Corporation, Southfield, Mich.

Filed Feb. 13, 1980, Ser. No. 121,088
Int. Cl.³ F04C *18/00, 29/08*
U.S. Cl. 418—1 15 Claims



1. A method of compressing fluid using a rotary fluid compressor including a housing defining a cavity therewithin having opposed inlet and outlet ports, a rotor rotatable in said cavity, said rotor having a pair of opposed apexes wiping the wall of said cavity to divide the latter into a pair of chambers, an inlet port check valve for permitting fluid communication through said inlet port into said cavity but preventing communication of fluid from said cavity through said inlet port, and an outlet port check valve for permitting fluid communication from said cavity through said outlet port but preventing communication into said cavity through said outlet port, said method comprising the steps of communicating one of the chambers with the inlet port and the other chamber with the outlet port, rotating said rotor with both of said check valves open to compress the fluid in said other chamber until the rotor attains a dead-center position in which the volume of said other chamber is minimized and the volume of said one chamber is maximized, closing both of said check valves at substantially the same time as said rotor rotates past said dead-center position, and continuing to rotate said rotor past said dead-center position into a position wherein at least one of said ports is communicated to both of said chambers while both of said check valves remain closed and thereafter continuing rotation of said rotor to communicate said one chamber to the outlet port and the other chamber to the inlet port while permitting said check valves to open.

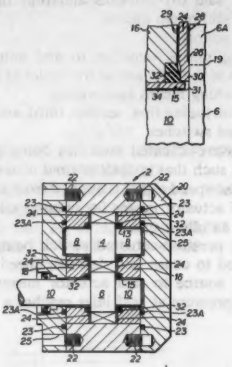
4,330,241
GEAR PUMP WITH PRESSURE LOADED BEARING BLOCKS AND SEPARATE GEAR SEALING PLATES

Roderick H. Spurry, Swindon, England, assignor to Plessey Overseas Limited, Ilford, England

Filed Sep. 13, 1979, Ser. No. 75,106
Claims priority, application United Kingdom, Sep. 15, 1978, 37071/78
Int. Cl.³ F04C *2/18, 15/00*
U.S. Cl. 418—132 3 Claims

1. In a gear pump having a pair of intermeshing gears which cooperate in a pump housing and are supported by a pair of bearing blocks which are biased towards the side faces of the gears;

the improvement comprising a flexible plate interposed between each bearing block and the adjacent side faces of the gears and movable in the pump housing toward and away from the gears, the plate covering the entire side face of the intermeshing gears and being pressure-loaded toward the gears by pump-delivery pressure acting on a predetermined area of the outer side of the plate to produce a force in excess of the oppositely directed force by the pressure reaching the inner surface of the plate from the tooth gaps approaching the region of intermesh, said predetermined area being confined by a resilient linear seal element so located in a groove in each bearing block as to include part-circular portions in which the resilient seal element faces the flexible plate, a continuous end-face area of each gear situated radially inwardly of the roots of the teeth of the gear by a sufficient distance to define an appreciable part-annular area facing the flexible plate in which sliding contact between the continuous end face of



the gear and the cooperating surface portion of the flexible plate forms a narrow gap having a resistance to leakage flow from the tooth-gap area towards the journal bearing of each gear, which resistance reduces mean pressure acting on the inner side of the plate in the said gap relative to the pump delivery pressure acting on the corresponding area at the outer side of the flexible plate, whereby the resulting pressure difference tends to minimize the width of said gap.

4,330,242
MACHINE FOR EXTRUDING HOLLOW CORED CONCRETE SECTIONS

George Putti, 1336 Camridge Pl., West Vancouver, Canada

Continuation of Ser. No. 33,751, Apr. 26, 1979, abandoned. This application Jan. 2, 1981, Ser. No. 222,090
Claims priority, application United Kingdom, May 3, 1978, 7817394
Int. Cl.³ B28B *21/08, 21/14, 21/42, 21/52*
U.S. Cl. 425—64 5 Claims

1. In a traveling machine for forming hollow cored concrete sections on a base which has a wheeled frame arranged for travel longitudinally of the base, a feed chamber having a hopper for enabling discharge of premixed concrete onto the base, a molding chamber following the feed chamber and at least one auger assembly extending through the feed chamber and molding chamber for moving the concrete into the molding chamber, wherein:

(a) the auger assembly includes an auger, a mandrel cooperating with and following the auger, vibrating means for imparting vibrations to the auger and mandrel, and a forming tube following and connected to the mandrel, the following tube being connected to the mandrel by vibra-

tion dampening means which attenuates vibrations transmitted from the mandrel,

(b) the molding chamber includes a pair of vertically disposed and longitudinally extending side plates mounted on the frame on opposite sides of the auger assembly for restraining lateral movement of the concrete,

(c) a longitudinally sectionalized top plate structure extends between the side plates and has:

(i) a lead section directly disposed over the auger and mandrel to provide vibrations of relatively large amplitude,

(ii) a trailing section directly disposed over the forming tube to provide vibrations of substantially smaller amplitude than those applied by the lead section,

(iii) vibrating means mounted on the top plate structure for vibrating the latter and arranged to provide vibrations of a greater amplitude to the lead section than to the trailing section,

whereby a greater amplitude of vibration is imparted to the concrete at the lead section of the top plate structure adjacent the mandrel than at the trailing section of the top plate structure adjacent the forming tube, the vibrations from the auger assembly being interfered with by the vibrations set up by the trailing section of the top plate to compact the concrete.

4,330,243

APPARATUS FOR MOULDING CONCRETE ELEMENTS

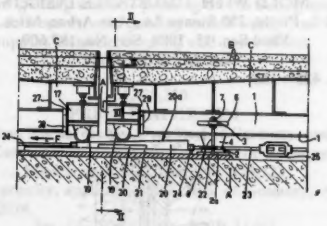
Pierre Legrand, Chatenay-Malabry, and Pierre Guinard, Maintenon, both of France, assignors to Freyssinet International (STUP), Boulogne-Billancourt, France

Filed Jun. 6, 1980, Ser. No. 157,214

Claims priority, application France, Jun. 13, 1979, 79 15131

Int. Cl.³ B28B *9/04*

U.S. Cl. 425—111 **8 Claims**



1. An apparatus for moulding at least a row of prestressed concrete elements and detaching them from their respective moulds comprising, on an elongated horizontal and plane area, at one end, thereof a stretching device and, at the other end, a releasing device for prestressing tendons; a set of parallel bare tendons connected to both said devices; at least a row of aligned, upwardly open moulds resting on said area and longitudinally displaceable thereon, said moulds being traversed by said set of tendons, each mould further comprising at least one vertically moveable bottom portion; a vertically displaceable push member associated with each of said moulds for lifting the corresponding bottom portion; cam means carried by said area for actuating said push members and actuating means for simultaneously operating said cam means.

4,330,244

APPARATUS FOR PRODUCING COUPLING ELEMENTS FOR SLIDE-FASTENER STRINGER

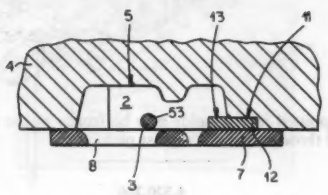
Helmut Heimberger, Steinhausen, Switzerland, assignor to Optilon W. Erich Heilmann GmbH, Cham, Switzerland

Filed Nov. 14, 1980, Ser. No. 207,077

Claims priority, application Fed. Rep. of Germany, Nov. 16, 1979, 2946228

Int. Cl.³ B29D *5/00*

U.S. Cl. 425—115 **4 Claims**



1. An apparatus for producing a row of coupling members for a slide-fastener stringer comprising:

a forming wheel provided on the periphery with a multiplicity of equispaced outwardly open forming beds having configurations complementary to contours of respective coupling members to be formed therein, and a circumferential outwardly open groove intersecting said beds;

an endless forming band extending around a portion of the periphery of said wheel and provided with openings respectively registering with said beds whereby said each opening and the bed in registry therewith forms a respective mold cavity;

an undercutting band received wholly in said groove and interposed between said periphery of said wheel and said forming band and projecting into said mold cavity, said forming band being of a width sufficient to span over said beds and said undercutting band on the periphery of said wheel; and

means for introducing thermoplastic synthetic resin into each of said mold cavities to produce respective coupling members of complementary shape therein whereby, upon separation of said members from said wheel and said bands, said undercutting band forms an undercut portion in each coupling member.

4,330,245

APPARATUS FOR PRODUCING FROZEN CONFECTIONS

Ronald J. Billett, Sunnyvale, Calif.; David N. Anderson, and William M. Easter, both of Lakeland, Fla., assignors to FMC Corporation, Chicago, Ill.

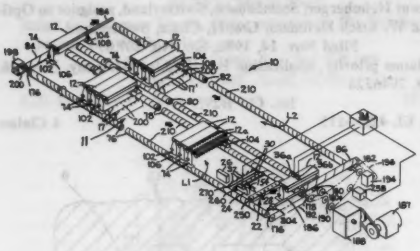
Filed May 5, 1980, Ser. No. 146,931

Int. Cl.³ A23G *9/26*

U.S. Cl. 425—126 S **18 Claims**

1. An apparatus for producing frozen confections comprising: a frame, a plurality of carriers, a plurailty of molds for receiving confection material individually mounted upon said carriers, slide tracks mounted to said frame and extending in a rectangular arrangement for slidably guiding the carriers for movement through a rectagular path in a horizontal plane, a plurality of conveyor screws mounted in a rectangular relationship parallel to said slide tracks for propelling the carriers along said rectangular path, means for rotating said conveyor screws in timed relation to each other, and means located

below portions of said rectangular path of travel for cooling the molds to freezing temperatures, whereby confection material deposited in the molds may be frozen as the molds are carried through said rectangular path.



4,330,246

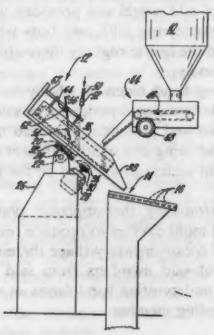
APPARATUS FOR CONTROLLING THE PROPORTION OF LIQUID AND DRY PARTICULATE MATTER ADDED TO A PELLETIZER

Eugene C. Varrasso, Heath, Ohio, assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Continuation of Ser. No. 974,419, Dec. 29, 1978, abandoned. This application Feb. 6, 1981, Ser. No. 232,068

Int. Cl.³ B28B *17/00*

U.S. Cl. 425—140 **8 Claims**



1. An apparatus for controlling the size of pellets produced by a pelletizer, said apparatus comprising:

(a) means for feeding a supply of particulate batch material to said pelletizer;

(b) means for feeding a supply of liquid to said pelletizer;

(c) means for sensing a characteristic indicative of the size of the pellets formed in said pelletizer from said particulate batch material and said liquid and for generating a first signal responsive thereto;

(d) means connected to said characteristic sensing means for integrating said first signal to generate a second signal, said integrating means having means for modifying the sensitivity of said integrating means to said first signal and means for modifying the magnitude of said second signal;

(e) means for sensing the rate of feed of said liquid to said pelletizer and for generating a third signal responsive thereto;

(f) means for combining said second and third signals to form a fourth signal;

(g) means for generating a set point signal;

(h) means for comparing said fourth signal with said set point signal to generate a fifth signal; and

(i) means responsive to said fifth signal for modifying the ratio of particulate batch material to liquid supplied to said pelletizer, thereby controlling the size of the pellets formed in said pelletizer from said particulate batch material and said liquid.

4,330,247

APPARATUS FOR FORMING MOULDED ARTICLES FROM A BLANK SHEET

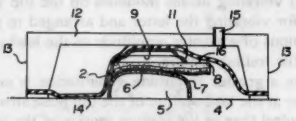
Serge L. Folschweiler, 5 Nelson St., Batawa, Ontario, Canada (K0K 1E0)

Filed Jun. 9, 1980, Ser. No. 157,378

Claims priority, application Canada, Jun. 12, 1979, 329544

Int. Cl.³ B29C *17/04, 17/06*

U.S. Cl. 425—174.8 E **9 Claims**



1. Apparatus for forming a removable shoe insole from a blank, said insole having a substantially flat base portion on its underside adapted to fit into a shoe, generally upstanding sidewalls and an upper side adapted to receive the foot of the wearer, said apparatus comprising a male mould bed having an upper surface corresponding to the shape of the insole on the upper side thereof, a plurality of rigid plates which are generally flat on a lower surface thereof, each said rigid plate being adapted to be placed on said male mould bed with a said blank between said mould bed and said plate, and said lower surface of each said rigid plate having a periphery of a different size corresponding to the underside of the base portion of a predetermined size of insole, a flexible diaphragm extending over said mould bed, and means for applying said flexible diaphragm against one said rigid plate and said mould bed with said blank therebetween whereby the upper side of the insole and said sidewalls are conformed to the shape of said mould bed and the shape of the underside of said base portion is determined by the shape of said one rigid plate.

4,330,248

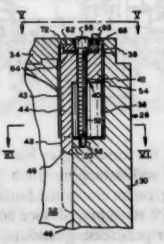
MOLD WITH ADJUSTABLE INSERTS

Richard L. Platte, 250 Sumac La., Ann Arbor, Mich. 48105

Filed Sep. 15, 1980, Ser. No. 187,609

Int. Cl.³ B29C *17/07*

U.S. Cl. 425—183 **5 Claims**



1. In a mold for blow molding synthetic plastic jugs wherein the jugs include side walls selectively having volume adjusting depressions defined therein, the mold including a cavity formed by side walls defining the jug side walls and a neck ring mounted upon the mold side walls, the improvement comprising, an elongated depression formable sleeve mounted on a mold side wall having a convex surface disposed toward the mold cavity and an open end, means mounting an elongated

insert member upon the mold side wall within said sleeve for selective projection from the sleeve end into the mold cavity and positioning relative to the mold side wall, said insert member having an exterior convex configuration for selective positioning within the mold cavity wherein movement of said insert member relative to the associated mold side wall selectively projects a variable volume of mass into the mold cavity, said insert member forming a jug volume adjusting depression in the molded jug side wall, the dimensions of the jug depression being determined by the relative adjustment of said insert member to the associated mold side wall and sleeve, adjustment means operatively associated with said depression formable insert member for selectively adjusting said insert member relative to its associated mold side wall, and locking means mounted on the mold selectively locking said insert member at a predetermined position of adjustment.

4,330,249

CONTINUOUSLY OPERATING PRESS

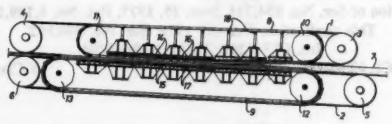
Stefan Petersson, Skanör, and Sven O. Alstad, Helsingborg, both of Sweden, assignors to Kockums Industri AB, Soderham, Sweden

Filed Nov. 21, 1980, Ser. No. 209,100

Claims priority, application Sweden, Dec. 12, 1979, 7910240

Int. Cl.³ B28B *3/00*

U.S. Cl. 425—329 **8 Claims**



1. A continuously working press for forming a continuous stringer of compressed material, comprising:

upper and lower continuously moving endless press chains formed by mutually linked support elements for pressing the stringer material in a vertical direction;

means for supporting said press chains;

two arrays of side-pressing blocks for pressing said stringer material in a lateral direction;

means for moving said arrays of side-pressing blocks in a transverse direction of the press chains and towards each other between the press chains;

means for guiding said side-pressing blocks during said transverse movement, said guiding means being conveyed by said support elements forming said press chains.

4,330,250

PRESS DIAPHRAGM

Peter Pinkas, Kochel am See, Fed. Rep. of Germany, assignor to Dorst-Keramikmaschinen-Bau, Fed. Rep. of Germany

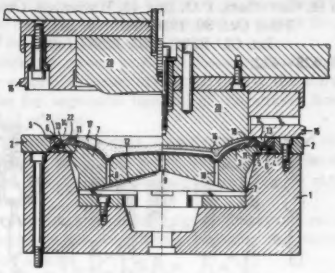
Filed Aug. 4, 1980, Ser. No. 174,733

Claims priority, application Fed. Rep. of Germany, Aug. 16, 1979, 2933226

Int. Cl.³ B28B *7/06*; B30B *11/02*

U.S. Cl. 425—389 **5 Claims**

1. A press for producing plates and other workpieces having a rounded peripheral edge, said press having a rigid upper press ram of a form designed to shape the inner form of the workpiece to be pressed, a mold body having a central chamber, a flexible diaphragm closing the top of said chamber, a rigid seat for said diaphragm in said cavity, said diaphragm when seated on said seat providing a china powder material receiving mold chamber between it and said ram; said diaphragm having a peripheral flange and means securing the peripheral edge of said diaphragm to said mold body, said press characterized in that said peripheral flange has a pair of radially spaced upwardly extending annular ridges of a height greater than the thickness of the workpiece to be formed in the press when the press is closed, the inner face of the inner one of said ridges being upwardly and outwardly inclined when said press is open; an annular upwardly opening concave channel between said ridges, the upper face of said diaphragm at the base of said inner face of the inner of said ridges having a shallow annular concavity of rounded cross-section; conduit means communicating from the base of said peripheral flange



intermediate said ridges for introducing fluid under pressure from said chamber to arch the bottom of said channel upwardly and in cooperation with the downward pressure of said ram on said ridges to force the top of the inner ridge to curve inwardly to form, in cooperation with said annular concavity, a rounded edge on the workpiece press formed therein.

4,330,251

DEVICE FOR MANUFACTURING ARTICLES OF COMPACTED POWDER

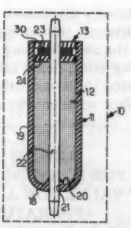
Jean-Marie Lebas, Rueil-Malmaison; Pierre Rat, Massy; Jean-Marcel Dupont, and Germain Vinuesa, both of Angouleme, all of France, assignors to Basset Bretagne Loire-BBL and Societe National des Poudres et Explosifs, both of, France

Filed Sep. 5, 1979, Ser. No. 72,584

Claims priority, application France, Sep. 12, 1978, 78 26140

Int. Cl.³ B29D *7/00*

U.S. Cl. 425—405 H **16 Claims**



1. A mold for use in connection with the manufacture of articles of compacted particulate material through isostatic compression, comprising:

a vessel formed of flexible or resilient material having a side wall defined by internal and external faces, said side wall having at least approximately a cylindrical shape and substantially constant wall thickness, said vessel being open at one end thereof;

a bottom wall integrally formed with said side wall at the end of said vessel opposite from said open end thereof;

a removable plug insertable into said open end to close same; and

wherein said side wall throughout its thickness including said internal and external faces thereof is curved radially outwardly over at least a portion intermediate of said ends thereof

whereby upon the application of external isostatic pressure,

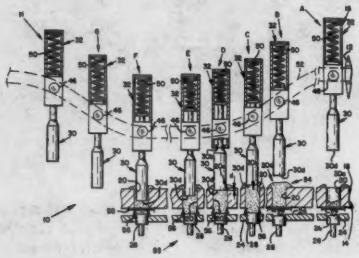
said side wall formed of flexible material is deformed to assume a substantially perfect cylindrical shape.

4,330,252

FOOD PACKING MACHINERY WITH DIFFERENTIAL FORCE-CONTROLLED PACKING ACTION

Kenneth W. Bullock, P.O. Box 443, Seaside, Oreg. 97138, and Eben H. Carruthers, P.O. Box 40, Warrenton, Oreg. 97146

Filed Oct. 30, 1980, Ser. No. 202,243
Int. Cl.³ B29C *3/02*; B29G *1/00*
U.S. Cl. 425—412 1 Claim



1. In a food packing machine including rotary turret mechanism having a cake-forming cavity movable with the mechanism through a defined cake-forming zone in the machine, a piston holder mounted for reciprocation toward and away from an entrance to the cavity, and a piston having a work face for compressing material in said cavity mounted in the holder for reciprocation between a pair of limit positions relative thereto into and out of the cavity through such entrance, one of said limit positions occurring with the piston maximally extended relative to the holder, and the other occurring with the piston minimally extended relative to the holder, piston drive means comprising

spring means operatively interposed in said holder between the piston and an end of said holder urging the piston toward its said one limit position relative to the holder, and

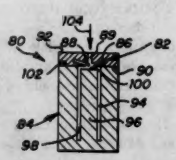
cam means operatively associated with the holder for guiding the same toward the cavity with movement of the cavity toward the cake-forming zone, said cam means, in the cake-forming zone, being constructed to effect placement of the piston in its said other limit position with the piston's work face adjacent the cavity's entrance.

4,330,253

COMPOSITE DIE FOR FORMING A PLUNGER FOR USE IN A SHUTOFF VALVE FOR A MEDICAL SUCTION APPARATUS

Robert L. Nichols, 808 Ft. Worth St., Jacksonville, Tex. 75766

Division of Ser. No. 923,397, Jul. 10, 1978, Pat. No. 4,256,109, which is a continuation-in-part of Ser. No. 923,346, Jul. 10, 1978, Pat. No. 4,245,637. This application Sep. 15, 1980, Ser. No. 187,073
Int. Cl.³ B29C *7/00*
U.S. Cl. 425—437 1 Claim



1. A composite die for forming a cylindrical hollow plunger having a concave disc integrally formed on one end of the plunger, comprising:

a plunger die having an annular cylindrical cavity formed therein for molding a cylindrical hollow plunger having a closed end;

a disc die for being positioned adjacent said plunger die to form the composite die, said disc die having a concave disc shaped cavity formed therein facing away from said plunger die and adjacent to said closed end, with an opening formed at the center of said disc shaped cavity and positioned over the center of said closed end of said annular cylindrical cavity;

a bore means extending from the center of said disc shaped cavity to said closed end of said disc die for injecting rubber into said disc die and plunger die and for injecting air into said disc die to facilitate removal of the rubber disc formed therein; and

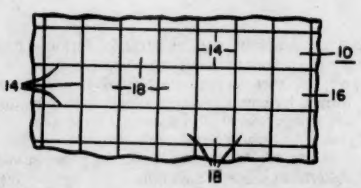
means for moving said disc die and said plunger die away from one another while injecting air through said bore to facilitate removal of the rubber disc formed within said disc die.

4,330,254

EXTRUSION DIE CONVERSION

George M. Cunningham, Horseheads, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Division of Ser. No. 854,716, Nov. 25, 1977, Pat. No. 4,139,144. This application Oct. 13, 1978, Ser. No. 950,992
Int. Cl.³ B28B *21/52*; B29F *3/04*
U.S. Cl. 425—466 5 Claims



1. An extrusion die for forming honeycomb structures of desired cellular configuration which comprises, a die body having an outlet face, a plurality of interconnected discharge slots communicating with said outlet face, means for feeding batch material to said discharge slots, a plurality of die pins formed in said outlet face intermediate said interconnected discharge slots, means secured to selected die pins for blocking off selected portions of said discharge slots, and said selected portions each being equal to the width of said die pin to which said blocking means is secured and to the thickness of the discharge slot adjacent the width of said pin and thereby provide said interconnected discharge slots with a discharge pattern for forming a honeycomb structure with a desired cellular shape.

4,330,255

ORIENTATION-BLOW MOLDING EQUIPMENT AND JIG USED THEREFOR

Sadao Suzuki, Tokyo, Japan, assignor to Yoshino Kogyosho Co., Ltd., Tokyo, Japan

Division of Ser. No. 973,439, Dec. 26, 1978, Pat. No. 4,233,010. This application May 30, 1980, Ser. No. 154,827
Claims priority, application Japan, Dec. 27, 1977, 52-159155
Int. Cl.³ B29C *17/07*
U.S. Cl. 425—529 4 Claims

1. Equipment for use in an orientation blow-molding process, comprising:

a jig comprising:

a neck support for holding a plastic piece in a neck portion downwards position;

a mandrel provided beneath said neck support comprising a disc and a cylinder disposed beneath said disc;

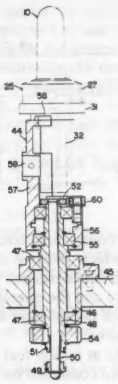
a core shaft upward and downwardly movably disposed in said mandrel, having a blowing air passage;

a cylindrical synthetic resin core guide disposed in said neck support, said neck support having a top surface shaped so as to be closely contactable with a blowing mold;

a core metal for releasably holding said jig, comprising:

a hollow holder;

a hollow shaft disposed in said hollow holder, having a bottom extending below the bottom of said hollow holder;



an ejector pin elevationally movably disposed in said hollow shaft, having a bottom extending below the bottom of said hollow shaft;

a spring disposed substantially between the bottom of said hollow shaft and the bottom of said ejector pin;

a cylindrical body attached to the upper portion of said hollow shaft;

a support holder extending upwardly from said cylindrical body, extending along only part of the circumference of said cylindrical body; and

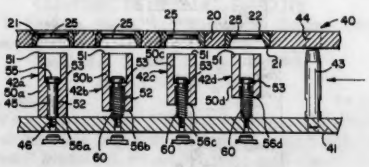
a magnet piece disposed in a substantially central portion of said support holder for magnetically attracting the cylinder of said mandrel.

4,330,256

MOLDED ARTICLE KNOCK-OUT APPARATUS

Jerry D. Reichenbach, Carpentersville, and Jamie R. Passarelli, Schaumburg, both of Ill., assignors to CR Industries, Elgin, Ill.

Filed Feb. 25, 1980, Ser. No. 124,068
Int. Cl.³ B29D *23/03*
U.S. Cl. 425—537 **15 Claims**



1. An apparatus for molding articles having a body formed from a cured material and bonded to a relatively rigid portion comprising

molding means for molding a plurality of articles,

said molding means including a molding member for supporting the plurality of formed molded articles in separate retained positions after a molding operation,

knock-out means mounted for operative movement relative to said molding member and adapted to engage the plurality of articles,

said knock-out means including force applying means to apply successive forces to selected ones of the plurality of articles for sequential removal of the articles from said retained positions,

said force applying means moves relative to said molding member to apply successive forces to the plurality of molded articles retained thereby in a single stroke of movement,

said force applying means includes a plurality of force applying members for respectively engaging the plurality of molded articles,

said plurality of force applying members are arranged in spaced relation to said plurality of molded articles in said first position and acts to engage respectively the plurality of molded articles on a simultaneous basis during said relative movement of said force applying means, and

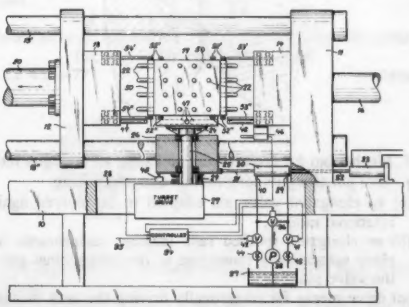
said force applying members further applying said successive forces during said single stroke of said relative movement upon said engagement with the molded articles.

4,330,257

TURRET-TYPE INJECTION-MOLDING MACHINE

Herbert Rees, Willowdale; Paul Brown, Orangeville, and Miroslaw Grund, Brampton, all of Canada, assignors to Husky Injection Molding Systems, Inc., Bolton, Canada

Continuation-in-part of Ser. No. 220,460, Dec. 29, 1980, abandoned, which is a continuation of Ser. No. 94,455, Nov. 15, 1979, Pat. No. 4,243,364. This application Feb. 24, 1981, Ser. No. 237,678
Int. Cl.³ B29F *1/022*; B29C *5/00*; B29F *1/14*
U.S. Cl. 425—556 **7 Claims**



1. An injection-molding machine comprising:

a pair of relatively movable platens;

a mold plate with at least one cavity on one of said platens communicating with a source of plastic material for forming a workpiece in said cavity upon relative movement of said platens toward each other into a mold-closed position;

a turret with at least four faces rotatable into as many operating positions about an axis transverse to the path of platen motion, said turret being shiftable along said path between said platens upon relative movement of said platens away from each other into a mold-open position and being provided with a core on each of said faces receivable in said cavity in a respective operating position for extract-

ing a freshly molded workpiece from said path of platen motion;

indexing means including coacting formations on at least one of said platens and on said turret for positively locking said turret in any operating position during incipient relative movement of said platens into said mold-closed position;

a companion plate on the other of said platens confronted by one of said faces in any operating position of said turret and adapted to receive the core of the confronting face during mold closure; and

ejection means on each of said faces for removing a workpiece from a respective core, at least one of said platens being provided with actuating means effective during a mold-closing stroke to engage the ejection means on a face of said turret not confronting either of said mold and companion plates for dislodging a workpiece in a direction away from said path.

4,330,258

INJECTION MOLDING MECHANICAL DOUBLE ACTING VALVE PIN ACTUATOR

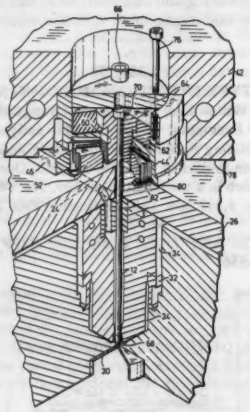
Jobst U. Gellert, 7A Prince St., Glen Williams, Ontario, Canada

Filed Oct. 28, 1980, Ser. No. 201,559

Claims priority, application Canada, Oct. 15, 1980, 362420

Int. Cl.³ B27F *1/05*

U.S. Cl. 425—564 **6 Claims**



1. Mechanism for reciprocally actuating an injection molding valve pin along its longitudinal axis comprising:

(a) an elongated valve pin adapted to be secured against rotational motion,

(b) an elongated toothed rack member reciprocable in a plane substantially transverse to the longitudinal axis of the valve pin,

(c) drive means for reciprocally driving the rack means in said plane according to a predetermined sequence,

(d) threaded means extending around a portion of and coaxial with said valve pin, said threaded means adapted to be secured to the valve pin, and

(e) a hollow rotatable pinion member having a threaded inner surface and a toothed outer surface secured against substantial transverse movement, the valve pin extending through the pinion member with the threaded means in threadable engagement with the threaded inner surface, the toothed outer surface of the pinion member being in engageable contact with the rack member,

whereby driving the rack member in one direction rotates the pinion member and actuates the valve pin along its longitudinal axis to a closed position, and driving the rack member in the opposite direction rotates the pinion member in the other direction and actuates the valve pin to an open position.

4,330,259

Patent Not Issued For This Number

4,330,260

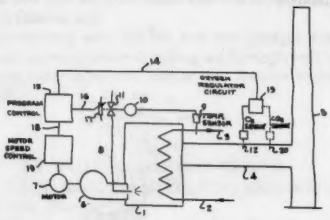
METHOD AND APPARATUS FOR REGULATING THE COMBUSTION IN A FURNACE

Lars L. S. Jorgensen, Ligustervej 1; Ernst V. Jorgensen, Hyrdedamsvej 23, and John H. Petersen, Birgittevej 30, all of DK-8220 Brabrand, Denmark

Filed Jan. 31, 1979, Ser. No. 8,686

Int. Cl.³ F23N *00/00*

U.S. Cl. 431—12 **12 Claims**



1. A method of controlling combustion in a furnace of a furnace system in which the rate at which fuel is supplied to the furnace is varied in accordance with the load being experienced by the furnace and the operation of a fan is regulated to vary the flow rate of combustion air supplied to the furnace, comprising the steps of:

measuring the rate at which fuel is supplied to the furnace,

providing a control command on the basis of the fuel supply rate to the furnace and air and gas flow characteristics of the furnace system, and

regulating operation of the fan to thereby control combustion air flow in accordance with the value of said control command.

4,330,261

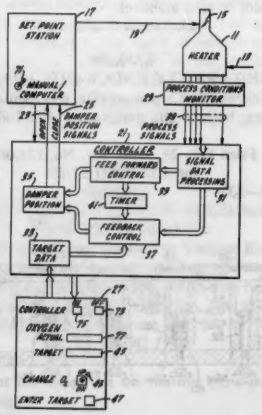
HEATER DAMPER CONTROLLER

James H. Sun, Homewood, Ill., assignor to Atlantic Richfield Company, Philadelphia, Pa.

Filed Sep. 17, 1979, Ser. No. 75,924

Int. Cl.³ F23N *3/00*

U.S. Cl. 431—14 **11 Claims**



1. Apparatus for controlling a stack damper for maintaining

stack oxygen content at an optimal level for minimizing fuel consumption of an associated heater in view of process conditions, comprising:

monitoring means for providing condition signals representative of a plurality of combustion process variables, said monitoring means measuring the excess stack oxygen level and generating an excess stack oxygen signal;

operator input means manually operable for permitting the operator to generate target data representative of an excess stack oxygen target value;

damper control means responsive to a damper control signal for positioning the damper according to said control signal; and

control means including:

(1) feedforward control responsive to said condition signals for generating a damper control signal for positioning the damper at a position for substantially providing an oxygen level anticipated for combustion;

(2) feedback control responsive to said target data and said excess stack oxygen signal for generating a said damper control signal for positioning the damper at a position for substantially providing an oxygen level dictated by said target value; and

(3) timing control responsive to said feedforward control demand for increasing combustion for inhibiting operation of said feedback control for a period of time.

4,330,262

WALKING BEAM FURNACE

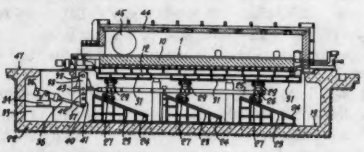
Franz A. Kranzl, and Helmut Springer, both of Dusseldorf, Fed. Rep. of Germany, assignors to Italimpianti Societa' Italiana Impianti p.A., Genoa, Italy

Filed Jul. 1, 1980, Ser. No. 166,684

Claims priority, application Fed. Rep. of Germany, Feb. 7, 1979, 2926661

Int. Cl.³ F27D *1/16*; B65G *25/00*; F27B *9/14*

U.S. Cl. 432—3 **8 Claims**



7. A method for maintenance of beams in a walking beam furnace having a fixed beam which lies in a hearth plane and a walking beam which moves transverse to said fixed beam by a normal working distance to move objects along said hearth plane, comprising:

moving said walking beam traverse to said hearth plane to a maintenance plane spaced from said hearth plane by an amount appreciably greater than said normal working distance while said fixed beam remains in said hearth plane, and

performing maintenance of the fixed or walking beam when said walking beam lies in said maintenance plane.

4,330,263

METHOD OF CONTROLLING A REHEAT FURNACE TO CONTROL SKID MARK EFFECTS

Donald J. Fapiano, Salem, Va., assignor to General Electric Company, Salem, Va.

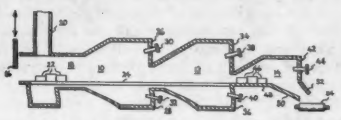
Filed Mar. 2, 1981, Ser. No. 239,393

Int. Cl.³ F27D *3/00*

U.S. Cl. 432—11 **7 Claims**

1. For use in association with a reheat furnace of the type having at least one heat zone, including support skids over which metal workpieces are moved, and a soak zone in which such workpieces reside for a period of time after leaving the supporting skids of the heat zone prior to being acted upon by a metal rolling mill, a method for controlling said furnace to limit, to acceptable levels, the variations in the deformation resistance of the workpiece during rolling operations due to temperature variations in the workpiece resulting from contact with such skids, said method comprising the steps:

(a) establishing for the furnace and the workpiece an initial skid mark characteristic expressing, at the time the workpiece leaves the supporting skids and enters the soak zone, the anticipated ratio of deformation resistance of the workpiece in at least one first region which was immediately contiguous to a one of the skids to the deformation resistance of a workpiece in a second region which was located approximately mid-way between adjacent skids;



(b) establishing a skid mark decay characteristic defining the decay of said skid mark characteristic as a function of time elapsed after the workpiece has left the skids;

(c) determining from said skid mark characteristic and said decay characteristic, the anticipated ratio of workpiece deformation of said first region to the workpiece deformation resistance of said second region at the expected time of rolling a workpiece;

(d) comparing said anticipated ratio to a predetermined value; and

(e) adjusting, as necessary, the time period of said workpiece remains in said soak zone based upon the results of said comparison.

4,330,264

APPARATUS FOR MANUFACTURING VITREOUS SLAG

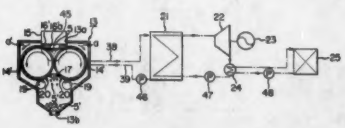
Jirou Konishi; Yasuto Takasaki; Kenji Ohkoshi; Akichika Ozeki; Shuji Kajikawa, and Haruo Itoh, all of Fukuyama, Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 29, 1981, Ser. No. 229,715

Claims priority, application Japan, Feb. 15, 1980, 55-16532

Int. Cl.³ F27D *15/02*; C21B *3/06*

U.S. Cl. 432—77 **3 Claims**



1. An apparatus for manufacturing a vitreous slag, which comprises:

a pair of cooling drums having the same diameter and the same length, the axial directions of said pair of cooling drums being arranged parallel to each other in the same horizontal level, and the peripheral surfaces of said pair of cooling drums being in contact with each other, each of said pair of cooling drums having a center axle;

a driving means for rotating said pair of cooling drums, said driving means being adapted to rotate said pair of cooling drums in directions opposite to each other at the same peripheral speed in the rising direction of the peripheral surface of each of said pair of cooling drums, at the contact portion of said pair of cooling drums;

a pair of weirs provided at the upper halves of the both ends of said pair of cooling drums so as to be in contact with said both ends of said pair of cooling drums, a slag sump

being formed by means of said pair of weirs and the bodies of said pair of cooling drums;

a slag feed means, arranged above said pair of cooling drums, for pouring a molten slag into said slag sump;

a scraper provided so as to be in contact with the lower halves of the peripheral surfaces of said pair of cooling drums;

a cooling medium for cooling said pair of cooling drums, said cooling medium being supplied, through the center axle of each of said pair of cooling drums, into each of said pair of cooling drums, said cooling medium exchanging heat with said molten slag in said slag sump, deposited onto the peripheral surfaces of said pair of cooling drums, along with the rotation of said pair of cooling drums, and said cooling medium which has exchanged the heat with said molten slag being discharged through said center axle of each of said pair of cooling drums for heat recovery, whereby said molten slag deposited onto the peripheral surfaces of said pair of cooling drums is converted into a vitreous slag through heat exchange with said cooling medium, along with the rotation of said pair of cooling drums, and peeled off from the peripheral surfaces of said pair of cooling drums by said scraper;

said apparatus being characterized in that:

said cooling medium comprises a high boiling point heat medium having a boiling point under 1 atmospheric pressure of at least 200° C., and said high boiling point heat medium is discharged, through said center axle of each of said pair or cooling drums, from each of said cooling drums under a low pressure of up to 5 kg/cm^2.

4,330,265

APPARATUS FOR THE SHRINKING OF WRAPPING FOILS

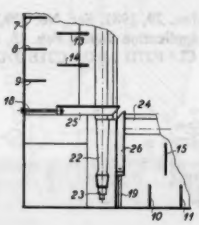
Kurt Lachenmeier, Sonderborg, and Peter Simonson, Graasten, both of Denmark, assignors to Kurt Lachenmeier ApS, Sonderborg, Denmark

Filed Mar. 19, 1980, Ser. No. 131,838

Claims priority, application Denmark, Mar. 27, 1979, 12331/79

Int. Cl.^{3} **F23D** *13/12;* **F24J** *3/00*

U.S. Cl. 432—224 **2 Claims**



1. An apparatus for shrinking wrapping foil around an article, wrapped with the foil, which comprises: a hollow frame arranged to pass around the article wrapped with foil, said frame having means for uniformly distributing air through the hollow portion of the frame, heating means for heating the air and slotted means along the inner portion of the frame for passing the air out of said hollow frame, said heating means comprising cylindrical gas burner means arranged to discharge combustion gases through the slotted means and wherein the air is heated by mixing with the combustion gases, said slotted means through which the air passes out of the frame comprising two parallel slots which extend along the inner edge of said frame adjacent to the sides of the combustion gas discharge slot, said hollow frame being a rectangular frame having a gas burner tube arranged on each side of the inner edge of the rectangular frame, said gas burner tube and air discharge slots being arranged on a telescoping section of said frame which is adjustable and movable in the plane of said frame to adjust the relation between the inner edge of the frame and the foil covered article.

4,330,266

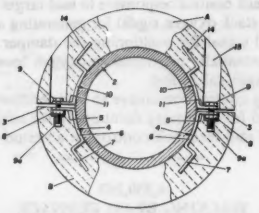
INSULATING TILE FOR REHEATING FURNACES

Paul V. Suey, 1043 Blackforest Rd., Pittsburgh, Pa. 15235

Filed Dec. 15, 1980, Ser. No. 216,268

Int. Cl.^{3} **F27D** *3/02;* **D03D** *49/24*

U.S. Cl. 432—234 **6 Claims**



1. For use in insulating water cooled tubes in metallurgical workpiece heating furnaces, the invention comprising:

(a) a pair of refractory tiles, each having a concave inner face the curvature of which through an arc at least greater than 90° conforms to the curvature of the tube about which the tile is to be placed, and a generally concentric outer surface, the tiles of the pair having generally flat edge walls which are substantially radial to the center of curvature of the inner face of the tile, and which are in confronting relation when the pair of tiles are in place about the tube,

(b) one tile of the pair having an arcuately extending metal insert embedded therein, the insert having a radial terminal at one end recessed into said flat edge surface of the tile in which it is embedded, said terminal having projecting therefrom a metal stud with a shank and an enlarged head,

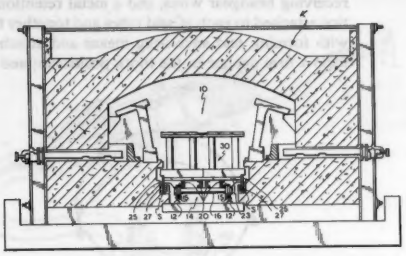
(c) the confronting flat edge surface of the second tile of the pair likewise having an arcuately extending metal insert, said insert also having a radial terminal recessed into the flat surface of its tile and which is transversely bifurcated to provide a slot extending part way across the terminal in the direction of the length of the tile, whereby, when the tiles are placed with their said confronting flat edge surfaces in face to face relation, the second tile may be moved in the direction of the length of the tile in such a manner that the shank of the stud in the first tile will be received in the bifurcation of the terminal of the slot in the terminal of the second tile, the head of the stud being larger than the width of the bifurcation to thereby connect the tiles against separation in direction radially of the tube to which they are to be applied and whereby they may thereafter be separated only by moving one tile relative to the other in the reverse direction to that by which they were joined, the flat edge surface of the second tile having an elongated cavity therein over only a portion of which the bifurcation in the radial terminal is located and the portion not covered by the bifurcation is positioned to initially receive the head of the stud before its shank enters the bifurcation and thereafter provide clearance for said head as the two tiles are first brought together for joining.

4,330,267

KILN CAR

Russell K. Wood, Morrisville, Pa., assignor to American Standard Inc., New York, N.Y.

Filed Nov. 17, 1980, Ser. No. 207,569
Int. Cl.[3] F27D 1/12; F27B 9/26
U.S. Cl. 432—241 8 Claims



1. In a kiln car having a carriage assembly including wheels for transporting the kiln car and product to be fired through a high temperature kiln, said kiln having a bench therein; a dense refractory superstructure of reduced mass mounted on said carriage assembly, a layer of insulating refractory forming a thermal barrier mounted on the upper surface of said carriage assembly, on which said superstructure is mounted; a load-bearing base of dense refractory of reduced mass and low heat capacity, having product-supporting means to provide a load bearing surface, the plane of which is adapted to lie below the plane of the bench of said kiln, to provide an increased cross-sectional area for product firing; the improvement comprising:

said load-bearing base including a plurality of reduced mass, dense, refractory blocks mounted transversely on said insulating refractory in spaced, parallel relation and having means for supporting an upper load-bearing base;

a plurality of spacer blocks disposed between said parallel, spaced blocks in interlocked relation and forming a perimeter of refractories around said carriage assembly;

a low density, low heat capacity, thermal-insulating material is positioned interiorly of said perimeter of refractory blocks, filling the spaces between said refractory blocks and said product-supporting means to form a load-bearing base of reduced mass and low heat capacity.

4,330,268

ROLLER HEARTH FURNACE FOR CERAMIC MATERIAL

Hermann Kremheller, and Michael Ciesla, both of Nuremburg, Fed. Rep. of Germany, assignors to Ludwig Riedhammer GmbH & Co. KG, Nuremburg

Filed Feb. 17, 1981, Ser. No. 235,411
Claims priority, application Fed. Rep. of Germany, Feb. 19, 1980, 3006114
Int. Cl.[3] F27D 3/00; F16D 3/14; B65G 13/06
U.S. Cl. 432—246 16 Claims

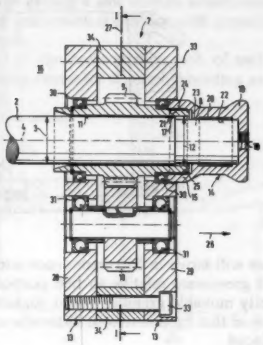
1. A system for conveying ceramic workpieces through a roller hearth furnace, comprising:

a plurality of conveying rollers rotatably mounted one behind the other in the workpiece conveying direction with their axes of rotation parallel to one another and perpendicular to the conveying direction, and defining a common support plane for the workpieces;

a plurality of drive gears each associated, and mounted coaxially, with a respective roller and provided with an axial bore having a diameter larger than that of said respective roller, with one axial end of each said roller extending into said bore of its associated drive gear;

means establishing a disconnectable rotationally secure connection between each said gear and its associated roller; and

a plurality of transmission gears each mounted for rotation about an axis parallel to the axes of rotation of said rollers and each engaging in an associated pair of adjacent drive



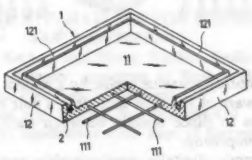
gears to form a gear train in which said drive gears alternate with said transmission gears so that force transmission between adjacent drive gears takes place through associated transmission gears and the application of power to said gear train causes all of said drive gears to rotate in the same sense and to rotate said rollers in synchronism.

4,330,269

REFRACTORY SAGGER

Shieh C. Chu, No. 1, Alley 2, Lane 474, Chung-Ho St., Pei-Tou District, Taipei, Taiwan

Filed Jan. 14, 1981, Ser. No. 225,146
Int. Cl.[3] F27D 5/00
U.S. Cl. 432—258 3 Claims



1. A refractory sagger comprising: a bottom wall having a netted frame which is defined by a plurality of alloy wires selected from the group consisting of nichrome wire, and ferrochrome wire, inserted therein, and a surrounding wall having an upwardly facing groove in the form of a closed loop surrounding said bottom wall, said groove being filled with glaze formed therein, said glaze having an expansion coefficient matching with the expansion coefficient of said refractory sagger.

4,330,270

CERAMIC GREENWARE SUPPORT

Lear C. Herrold, Derry, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

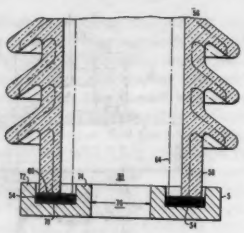
Filed Jun. 10, 1980, Ser. No. 158,089
Int. Cl.[3] F27D 5/00
U.S. Cl. 432—259 16 Claims

1. Apparatus for supporting ceramic greenware during the firing thereof, comprising:

(a) a container; and

(b) a plurality of independently movable granules disposed

within said container, a portion of said granules cooperating to support said ceramic greenware, said independently movable granules being disposed at a predetermined depth sufficient to assure a significant portion of those granules which support and are in contact with said greenware will move in correspondence with the shrinkage of said greenware relative to that portion of said independently movable granules not in contact with said greenware so that friction related distortion of said greenware is reduced.

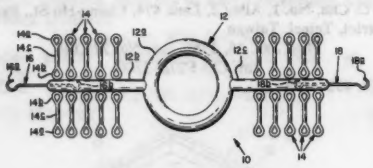


4,330,271

ORTHODONTIC-DISPENSER AND TOOL COMBINED WITH DISPENSED ARTICLES

Roland M. Anderson, Portland, Oreg., assignor to Modcom, Inc., Canby, Oreg.

Filed Jan. 12, 1981, Ser. No. 224,383
Int. Cl.³ A61C 7/00
U.S. Cl. 433—3 **2 Claims**



1. Orthodontic apparatus usable by a patient wearing orthodontic hardware of the type including a pair of spaced hook-like elements to place tension between such elements, said apparatus comprising:

an elastomeric digitally manipulatable carrier portion including at least one elongated flexible projecting finger,

a plurality of elastomeric intraoral orthodontic devices severably joined to and integral with the finger in said carrier portion, each device including at least a pair of operatively interconnected endless loops or the like, and

a relatively rigid reverse-bend catch joined to and projecting axially from the outer end of said finger for receiving releasably a selected loop in a device severed from said carrier thus to enable maneuvering of the severed device, through maneuvering of said catch, adjacent and within a person's mouth to place one loop in the device in a caught relationship over one of such hook-like elements, and another loop in the device in a caught relationship over the other element.

4,330,272

MEANS FOR ATTACHING A HEADGEAR TO A POSITIONER

Earl O. Bergersen, 950 Linden Ave., Winnetka, Ill. 60093

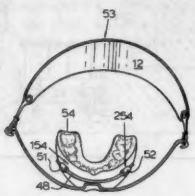
Filed Mar. 4, 1980, Ser. No. 127,051
Int. Cl.³ A61C 3/00
U.S. Cl. 433—5 **10 Claims**

1. An improved orthodontic appliance of the type combining a resilient intraoral tooth positioner in arch form with a cervical headgear, wherein the improvement comprises:

means for a temporary attachment of the cervical headgear to the tooth positioner comprising:

anchoring means permanently affixed in the tooth positioner which comprises:

at least a pair of headgear tubes of a diameter capable of receiving headgear wires, and a metal retention portion attached to each of said tubes and together therewith forming said anchoring means and attached to form a firm anchor in the tooth positioner; and



wire means for connection to the cervical headgear, said anchoring means and said wire means having detachable coupling means therebetween,

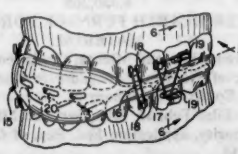
whereby the cervical headgear may be selectively used during orthodontic treatment using the tooth positioner and the headgear tubes, which are firmly anchored to the tooth positioner via the attached metal retention portion thereof, receive the headgear wire means and transmit the force applied by the headgear to the tooth positioner.

4,330,273

ORTHODONTIC APPLIANCE AND METHOD FOR PRODUCING OCCLUSION

Peter C. Kesling, Green Acres, LaPorte, Ind. 46350

Filed Jul. 21, 1980, Ser. No. 170,683
Int. Cl.³ A61C 7/00
U.S. Cl. 433—5 **10 Claims**



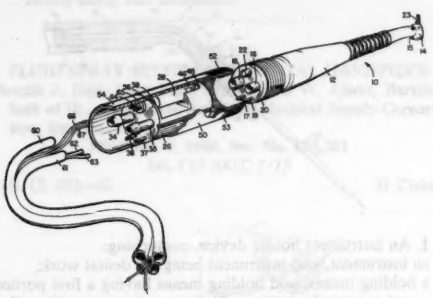
1. An orthodontic appliance for achieving the best possible or ideal occlusion between the teeth of the arches comprising, resilient means to be placed between the arches and having occlusal tooth receiving archways which are arranged in the best possible or ideal occlusal positions, and means for applying eruptive forces to at least some of the teeth to coact with the resilient means and move the teeth into fully seated positions in said archways, said eruptive force applying means including anchor means mounted on the labial/buccal or lingual surface of the teeth and the labial/buccal or lingual surface of the resilient means, and tensioned elastic means connected between the anchor means on the teeth and the anchor means on the resilient means.

4,330,274

LIGHTING SYSTEM FOR A DENTAL HANDPIECE

Joshua Friedman, 13 Fairfield Ct., Ridgefield, Conn. 06877, and Maurice F. Zetena, Jr., 31 Lampost Dr., West Redding, Conn. 06896

Filed Mar. 30, 1981, Ser. No. 248,971
Int. Cl.³ A61C 3/00
U.S. Cl. 433—29 6 Claims



1. A lighting system for use in combination with a fluid driven dental handpiece having a proximal end with fluid transmitting conduits extending therefrom in a standardized configuration, said lighting system comprising:

a lamp assembly including a thermally conductive block having a plurality of longitudinal passageways extending from one end of the block in an arrangement for coupling to the fluid transmitting conduits of said handpiece and terminating at the opposite end of the block;

conduit means extending from said passageways at the opposite end of said block for engagement with a plurality of air/water supply lines;

slidable means for removably coupling the lamp assembly to the handpiece;

said block having a cavity for housing a miniature halogen lamp with the halogen lamp being longitudinally seated in said cavity;

means in said cavity for detachably engaging said lamp such that said lamp may be removed for replacement without disturbing the fluid interface between the block and the supply tubing;

said halogen lamp having a light transmitting end disposed in close proximity to said one end of said block for adjoining a predetermined position at the proximal end of said handpiece, and having a base at the opposite end adapted for connection to a source of power; and

wherein said slidable means includes an aperture in a predetermined location and means for engaging said block in a first position for enclosing said lamp assembly and in a second position for exposing the light transmitting end of the lamp through said aperture.

4,330,275

ARTICULATOR FOR MODELS OF DENTAL ARCHES

Jose M. Gama, Praca de Bandeiro 200, Belo Horizonte, Minas Gerais, Brazil

Filed Sep. 4, 1980, Ser. No. 184,130
Claims priority, application Brazil, Dec. 9, 1979, 7905829[U]
Int. Cl.³ A61C 11/00
U.S. Cl. 433—57 3 Claims

1. In an improved articulator for models of dental arches of the type having an upper part and a lower part with similar branches which are substantially horizontal and parallel to each other and articulating means connecting the parts, the improved articulator means comprising

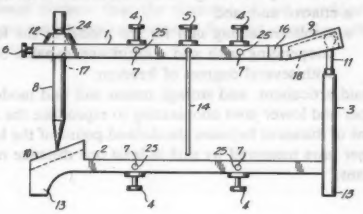
a pair of spaced articular wings extending upwardly at a slight angle from the rear of the horizontal branch of the upper part,

a pair of arms extending laterally from said branch for connecting said arms to said horizontal branch, said arms being connected to said respective wings at the front and lower part of the latter,

each of said wings having a slot therein which includes a rear wall and a wall which is exterior with respect to the horizontal branch,

the front portion of the horizontal branch of said upper portion containing means for adjustable holding an incisal pin,

an incisal pin in the latter,



the lower part of said articulator containing a pair of uprights mounted thereon to extend upwardly to a region adjacent the wings of said upper part,

a pair of articulator pins at the end of said uprights fitting into the respective slots of said wings and each being retained within the rear and external walls of its respective wing,

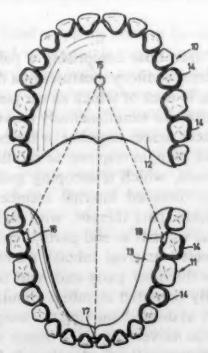
the front portion of the horizontal branch of said lower part containing an incisal tray sloping downwardly at a small angle away from the horizontal branch, whereby said upper part is articulatingly supported on the lower part as a tripod with a low center of gravity.

4,330,276

PROCESS AND APPARATUSES FOR REPRODUCING JAW MOVEMENTS

Günter Becker, Aachen, and Horst Weiden, Stolberg, both of Fed. Rep. of Germany, assignors to Becker Dental-Labor GmbH, Aachen, Fed. Rep. of Germany

Filed Sep. 5, 1980, Ser. No. 184,410
Claims priority, application Fed. Rep. of Germany, Sep. 8, 1979, 2936328
Int. Cl.³ A61C 19/04
U.S. Cl. 433—69 20 Claims



1. Apparatus for reproducing jaw movements of a patient comprising:

upper and lower jaw plates for placement in the mouth of a patient against the upper and lower jaws of the patient;

at least one distance measuring means secured at said upper and lower jaw plates for measuring distances between said upper and lower jaw plates in the mouth of a patient, said at least one distance measuring means being located within the mouth of the patient when said upper and lower jaw plates are placed in the mouth of the patient;

storage means for said measured distances; and

an articulator carrying models of the upper and lower jaws, said upper and lower jaw plates being mountable in said models of the upper and lower jaws, wherein said articulator comprises:

a stationary receiving unit for the model of the upper jaw;

a control unit; and

a mobile receiving unit for the model of the lower jaw cooperating with said control unit capable of moving with several degrees of freedom;

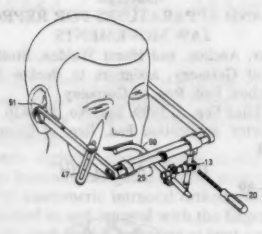
said articulator, said storage means and said models of the upper and lower jaws cooperating to reproduce the combinations of distances between the defined points of the lower and upper jaws measured by said at least one distance measuring means.

4,330,277

DENTAL FACE BOW

Richard A. Beu, Eggertsville, N.Y., assignor to Teledyne Hanau, Buffalo, N.Y.

Filed Mar. 21, 1980, Ser. No. 133,495
Int. Cl.³ A61C *19/04*
U.S. Cl. 433—73 **7 Claims**



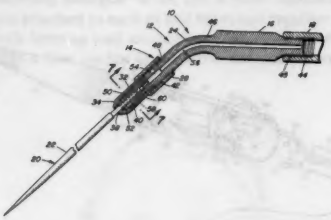
1. A dental face bow comprising a pair of ear pieces for fitting the external auditory meatuses of a dental patient, a pair of temple arms, to each of which an ear piece is held, threaded telescoping means for simultaneously moving the temple arms and the ear pieces nearer together or farther apart, as desired, in a straight line path, in response to rotation of a part of such telescoping means, which telescoping means include a rotatable externally threaded internal member having a thumb wheel at a middle part thereof, with right handed and left handed external threads at end parts thereof, and matchingly internally threaded external tubular members about sides of said externally threaded parts and held to the temple arms, which internally threaded members simultaneously move together or apart, as desired, moving the temple arms with them, in response to the movement of the thumb wheel, and auxiliary telescoping means parallel to the threaded telescoping means and joined to the temple arms, so as to prevent relative rotation of such arms.

4,330,278

ENDODONTIC FLOW-THROUGH ULTRASONIC INSTRUMENT HOLDER DEVICE

Howard Martin, 909 Pershing Dr., Silver Spring, Md. 20910

Filed Jun. 30, 1980, Ser. No. 164,366
Int. Cl.³ A61C *5/02*
U.S. Cl. 433—81 **10 Claims**



1. An instrument holder device, comprising:

an instrument, said instrument being for dental work;

a holding means, said holding means having a first portion and a second portion, said first portion consisting of at least two nibs and cylindrical-like part, said nibs being located at the distal end of said first portion, said cylindrical-like part being located immediately adjacent to and integral with said nibs, said cylindrical-like part having external screw threads thereon, said nibs being spaced apart around the periphery of said distal end of said first portion, said nibs having a clearance space between the sides thereof and the sides of adjacent nibs, said nibs being tapered on the exterior of the distal end thereof, said holding means having a continuous passageway therethrough, said first portion and said second portion being adjacent to, a continuation of, and integral with, each other, said passageway being continuous through both said first and second portions, said passageway having a counter-bore, said counter-bore extending inwardly from the distal end of said nibs, one end of said instrument being removably inserted into said counter-bore, said instrument having a mounting end thereon configured to fit withing said counter-bore, said second portion having external screw threads thereon, said external threads on said second portion being located on the distal end thereof opposite to said distal end of said first portion; and

a locking means, said locking means being configured as a hollow, cylindrical-like body, said body having a first end and a second end, said body having a passageway therethrough, said passageway having internal screw threads in said passageway at said first end of said body, said internal screw threads mating with said external screw threads on said cylindrical-like part of said first portion of said holding means, said body of said locking means being reduced in configuration in relation to said passageway therethrough at said second end thereof, said first end of said holding means being removably inserted into said first end of said locking means and removably assembled thereto by engaging said external screw threads on said first portion of said holding means with said internal threads in said locking means, thereby locking said end of said instrument within said nibs of said holding means, said locking means being removably affixed to said holding means to secure said instrument in said holding means, said instrument being locked in place by tightening said locking means on said holding means, whereupon said tapered ends of said nibs interface with the internal periphery of said passgeway and tighten upon said mounting end of said instrument as said locking means is further tightened, a portion of the exterior of said locking means being configured to provide a suitable surface for attachment of a wrench means for tightening said locking means when assembled with an instrument therein, said passageway in

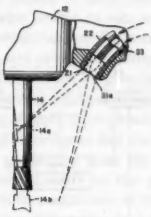
said holding means cooperates with the internal configuration of said locking means so as to formulate a communicating series of passageways within said instrument holder device for the passage of a solution therethrough, said series of passageways consisting of said passageway through said holding means, including said counter-bore, the opening between spaced apart nibs, and the passageway in said locking means, said solution being discharged axially along said instrument.

4,330,279

FLUID SPRAY SYSTEM FOR DENTAL HANDPIECE

Donald J. Heil, Lake Villa, and Thomas W. Albert, Bartlett, both of Ill., assignors to American Hospital Supply Corporation, Evanston, Ill.

Filed Jan. 7, 1980, Ser. No. 109,761
Int. Cl.³ A61C 1/12
U.S. Cl. 433—82 21 Claims



1. A dental handpiece comprising a hollow handle having a proximal end portion adapted for connection to a supply hose containing conduits for the supply of air and water to said handle, an elongated body portion, and a neck portion terminating at its distal end in a head assembly; said head assembly including a housing, an air turbine within said housing adapted to be driven by air supplied through said handle, and a chuck for operatively connecting a dental bur to said turbine; wherein the improvement comprises

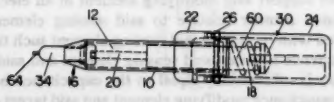
said handle containing a spray tube assembly comprising a pair of tubes defining passages for conducting water and chip air from the proximal end of said handle to a nozzle adjacent said head assembly; said nozzle including a chamber of oval cross sectional configuration terminating in an oval discharge orifice facing towards the location for the tip of a dental bur when the same is supported by said head assembly; said nozzle having the greater transverse axes of its oval chamber and oval discharge orifice extending in the same plane as the rotational axis of said turbine, chuck, and bur.

4,330,280

EJECTOR HOLDER FOR CAPSULE-LIKE CARTRIDGE

Emery W. Dougherty, and Richard E. Welsh, both of Milford, Del., assignors to Dentsply Research & Development Corp., Milford, Del.

Filed Apr. 9, 1981, Ser. No. 252,558
Int. Cl.³ A61C 5/04
U.S. Cl. 433—90 4 Claims



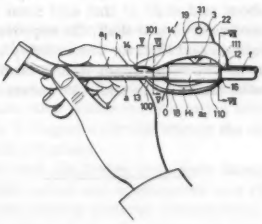
1. A manually operable ejector holder and a loaded capsule-like cartridge in which said cartridge has an annular collar on one end and a discharge tip on the other, and said holder comprising in combination, an elongated barrel, a plunger reciprocable therein and one end projecting beyond said barrel, manually operable lever means on one end of said barrel operable to reciprocate said plunger relative to the other end of said barrel, and said other end of the barrel being cutaway longitudinally a limited distance to provide a compartment having sidewalls extending a limited distance beyond the axis of said barrel, an undercut groove formed in said compartment within said sidewalls to receive the annular collar on said cartridge to prevent relative axial movement between said cartridge and compartment, and the outer longitudinally-extending portions of the sidewalls of said compartment having limited flexibility and extending toward each other a slightly lesser distance than the diameter of said cartridge to effect a snap-acting retaining means for said cartridge when inserted into said compartment.

4,330,281

HOLDER FOR A DENTAL HANDPIECE

Kazuo Hayashi, Yahata, Japan, assignor to Kabushiki Kaisha Morita Seisakusho, Kyoto, Japan

Filed Apr. 14, 1981, Ser. No. 254,050
Claims priority, application Japan, Apr. 14, 1980, 55/51626[U]
Int. Cl.³ A61C 1/08
U.S. Cl. 433—108 3 Claims



1. A holder for holding a dental handpiece having a grip portion of a first diameter and a tail-stock portion of a larger diameter in a generally horizontal or inclined posture comprising:

a trough shaped front gripping portion having a left front sidewall provided with a single supporting portion, a right front sidewall provided with a pair of axially spaced supporting portions, and an inclined lower front edge extending from the vicinity of said left front sidewall supporting portion to the forward one of said pair of supporting portions, the axial position of said left front sidewall supporting portion being intermediate the corresponding axial locations of said pair of supporting portions, the height of said right and left front sidewalls having a dimension approximately equal to that of the radius of said handpiece grip portion; and

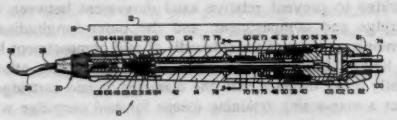
a trough shaped rear gripping portion having left and right rear sidewalls each provided with a single supporting portion, and a brim extending tangentially from the upper edge of said rear sidewall, the height of said left rear sidewall having a dimension approximately equal to that of the radius of said handpiece tail-stock portion and said right rear sidewall having a height dimension greater than that of the radius of said handpiece tailstock portion.

4,330,282

ROTOR DRIVEN VIBRATORY DEVICE HAVING ROTOR CENTRALIZATION MEANS AND VIBRATIONAL MODE SELECTION MEANS ASSOCIATED THEREWITH

John E. Nash, Downington, Pa., assignor to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Filed Nov. 5, 1979, Ser. No. 91,016
Int. Cl.[3] A61C *1/07, 3/03*
U.S. Cl. 433—118 72 Claims



1. In a dental scaler comprising elongated casing means having a proximal end and a distal end; resilient support means within said casing means; a substantially rigid hollow shaft supported within said elongated casing means by said resilient support means; work tool connecting means adjacent the distal end of said shaft, said work tool connecting means capable of operatively connecting a work tool to the distal end of said shaft, said shaft having fluid media inlet means and outlet means, respectively, for receiving and discharging fluid media, rotor means disposed about said shaft, said rotor means being positioned over said outlet means, said rotor means driveable about said shaft by the fluid media, said shaft and said rotor means each having a configuration and disposed with respect to each other so as to define a space therebetween for receiving said fluid media from said outlet means during movement of said rotor means about said shaft, the flow of the fluid media from said outlet means into the space driving said rotor means rotatively about said shaft so that said rotor means imparts vibratory movement to said shaft, the improvement comprising first means on said shaft for continuously correcting axial displacement of said rotor means from a centralized position over said outlet means when said rotor means is driven about said shaft.

4,330,283

SYNTHETIC DENTAL COMPOSITIONS FOR PRODUCTION OF DENTAL RESTORATIONS, AND DENTAL RESTORATIONS PRODUCED THEREFROM

Rudy Michl, Schaan, and Hanspeter Willi, Vaduz, both of Liechtenstein, assignors to Etablissement Dentaire Ivoclar, Schaan, Liechtenstein

Filed Feb. 4, 1981, Ser. No. 231,549
Claims priority, application European Pat. Off., Feb. 8, 1980, 80100639
Int. Cl.[3] A61K *6/08*
U.S. Cl. 433—201 11 Claims

1. A synthetic dental composition for the production of dental restorative structures comprising

(a) one or more polymerizable methacryl compounds of which at least one is a polyfunctional methacrylate, optionally in admixture with a polymerization inhibitor; or

(b) a synthetic dental composition produced from (a) by polymerization, or a mixture of (a) and (b); and

(c) a catalyst comprising at least one 2,2'-dialkylbenzopinacol wherein the optically substituted alkyl group contains from 1 to 6 carbon atoms.

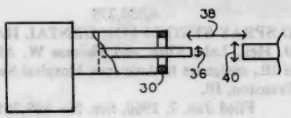
11. A dental restorative structure in the form of an artificial tooth, crown, bridge or dental prosthesis, comprising the composition of claim 1.

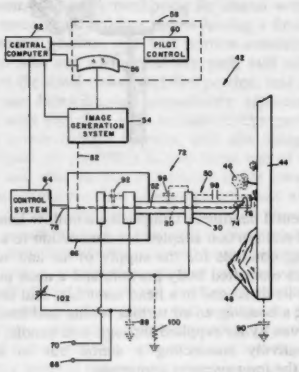
4,330,284

CAPACITIVE SENSING DEVICE

Martin Dotsko, and Kadam S. Lakshminarayanasetty, both of Binghamton, N.Y., assignors to The Singer Company, Binghamton, N.Y.

Filed May 29, 1979, Ser. No. 42,760
Int. Cl.[3] G09B *9/08*
U.S. Cl. 434—38 5 Claims





1. A capacitive sensing system for use in protecting the optical probe of a camera model visual system and substantially equally sensitive to metallic, non-metallic, small and large target objects, comprising:

an optical probe of the type used in a camera model visual system;

a terrain model board having means to define said small and large target objects as being structures and contours;

a control system for controlling movement of said optical probe relative to said terrain model board;

a capacitive sensing device having a sensing element fabricated from an electrically conductive material; monitoring circuitry electrically connected to said sensing element of said capacitive sensing device for monitoring changes in the capacitance between said sensing element and said target objects;

a toroidal-shaped capacitance modifying element fabricated from an electrically conductive material;

means to support said modifying element in an electrically insulated manner relative to said sensing element, and located with respect to said sensing element such that said capacitance between said sensing element and said target objects is substantially equal to the capacitance between said capacitance modifying element and said target objects when said capacitance sensing device is at a preselected distance from said target objects; and

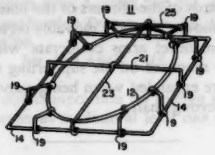
wherein said monitor circuitry provides a signal to said control system when said optical probe moves closer than a preselected distance to a target object.

4,330,285

ORIENTATOR

Henry T. Mitchell, Jr., 110 Garrett Ave., Rosemont, Pa. 19010

Filed May 12, 1980, Ser. No. 149,052
Int. Cl.³ G09B 21/00
U.S. Cl. 434—113 11 Claims



1. An orientator, for enabling visually handicapped persons to tactilely examine specific details of three dimensional surfaces which they are otherwise unable to see, in combination with at least one three dimensional relief illustration having structure defining a border, said orientator comprising:

a substantially planar grid structure for overlaying the surface, the grid structure having a first set of members defining relatively large open sectors through which fingers of the hands may be passed in order to feel the surface; and,

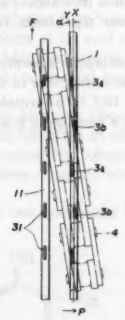
a second set of members projecting from the periphery of the grid structure perpendicularly to the grid structure plane for engaging the border structure of the at least one relief illustration and for holding the grid structure in a sufficiently spaced relationship from the surface of said illustration to enable the fingers of the hands to move freely between the grid structure and the surface unhampered by the grid structure itself, whereby the attention of the visually handicapped persons can be directed to a specific detail of the at least one relief illustration by a reference to the sector in which it is disposed.

4,330,286

SPROCKET FOR BICYCLE AND THE LIKE

Masashi Nagano, Sakai, Japan, assignor to Shimano Industrial Company Limited, Osaka, Japan

Continuation of Ser. No. 933,572, Aug. 14, 1978, abandoned.
This application Dec. 21, 1979, Ser. No. 106,048
Claims priority, application Japan, Aug. 17, 1977, 52-110437; Aug. 17, 1977, 52-110438
Int. Cl.³ F16H 55/30
U.S. Cl. 474—164 5 Claims



1. A sprocket assembly of at least two sprocket bodies for a bicycle for selecting a driving chain, said chain being shiftable along a line which is angular to the sprocket comprising:

a first circular sprocket body having a plurality of teeth along the periphery thereof, said teeth having a cross-section for receiving a driving chain and

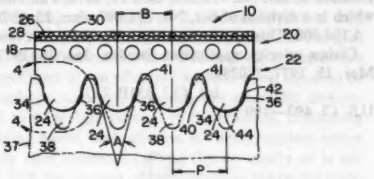
a second circular sprocket body having a diameter larger than the diameter of said first circular sprocket body coaxial with said first circular body having a plurality of teeth radially extending thereof, at least two of said teeth having a rectangular cross-section, the major axes of said two teeth coinciding with an inclined line inclined away from said second sprocket body towards said first sprocket body in the direction of movement of said bicycle, whereby said two teeth are easily meshed with said chain during shifting of said chain.

4,330,287

RIBBED POWER TRANSMISSION BELT

Richard J. Fischer, Aurora, Colo., assignor to The Gates Rubber Company, Denver, Colo.

Filed Feb. 28, 1980, Ser. No. 125,416
Int. Cl.³ F16G 5/00, 1/00
U.S. Cl. 474—238 9 Claims



1. In a power transmission belt and pulley system, the belt of the reinforced elastomer and generally flat type having circumferential ribs laterally spaced from each other within manufacturing tolerances and the pulley with grooves laterally spaced from each other within manufacturing tolerances that define generally V-shaped walls that engage the ribs, wherein the improvement comprises:

belt ribs with each rib having oppositely facing sides that convergently extend and interconnect to a rib apex, the sides defining driving surfaces characterized by convex sidewall portions which when viewed in free span cross section protrude beyond corresponding portions of the V-shaped walls of the grooved pulley and define a belt wear-in means for accommodating manufacturing tolerance differences between the laterally spaced belt ribs and the laterally spaced pulley grooves.

4,330,288

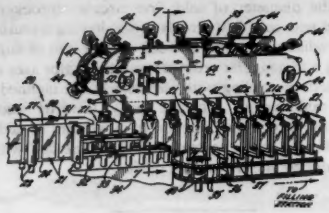
PACKAGING MACHINE WITH POUCH TRANSFER AND OPENING MECHANISM

Robert C. Russell; Charles A. Burton; Ronald K. Coleman, all of Columbus, and Dwain R. Schroeder, Columbus Grove, all of Ohio

Filed Feb. 7, 1980, Ser. No. 119,366
Int. Cl.³ B31B 23/02
U.S. Cl. 493—197 10 Claims

1. A packaging machine having means for advancing a strip of interconnected, upright and open-ended pouches edgewise along a predetermined path with the open ends of the pouches facing upwardly and disposed at a predetermined elevation, means for periodically cutting successive leading pouches from the strip, means for turning each severed pouch ninety degrees about its vertical centerline, and means for advancing the

pouch broadwise toward a filling station while keeping the upper end of the pouch disposed at said predetermined elevation and while keeping the centerline of the pouch moving along a linear path.



4,330,289

APPARATUS FOR MANUFACTURING A LINED CONTAINER

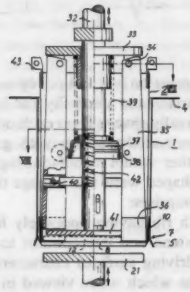
Od W. Christensson, Veddestavägen 7 - 9, S-175 62 Järfälla, Sweden

Division of Ser. No. 952,296, Oct. 18, 1978, Pat. No. 4,226,170, which is a division of Ser. No. 871,497, Jan. 23, 1978, Pat. No. 4,184,608. This application Mar. 24, 1980, Ser. No. 133,096

Claims priority, application Sweden, Jan. 26, 1977, 7708068; Mar. 15, 1977, 7702899

Int. Cl.³ B31B *7/02*

U.S. Cl. 493—100 **3 Claims**



1. Apparatus for the manufacture of a container comprising an outer container of cardboard or similar stiff material and a lining of synthetic resin or any other easily formable material which is applied in the outer container and which at one end of the container exposes an openable lining side and which is adapted to be filled and closed at the opposite end, and in which the lining bag at the opening side thereof is somewhat pressed into itself thereby providing a projecting lining rib extending around the openable lining side and in which the lining rib is kept enclosed between top flaps and sides of the outer container, comprising an expandable mandrel including a number of rotatably mounted mandrel arms which at the lower ends thereof are formed with a thin corner rib, which mandrel arms are rotatable in directions out towards the corners of the container, whereby an expansion of the mandrel arms provides a pressing outwards of the corners of the lining bag, said mandrel arms being mounted axially movably on a supporting shaft such that said mandrel arms cooperate with a cam means which is fixedly mounted on the supporting shaft, so that the mandrel arms are expanded when being moved down in relation to the supporting shaft.

4,330,290

METHOD OF PRODUCING WRAPPING FOR CIGARETTES

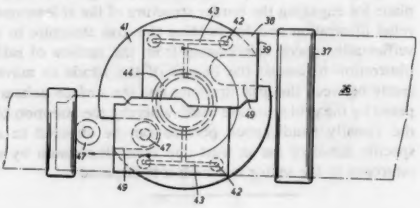
Heinz Focke, Verden, Fed. Rep. of Germany, assignor to Focke & Pfuhl, Verden, Fed. Rep. of Germany

Division of Ser. No. 922,697, Jul. 7, 1978, Pat. No. 4,213,362, which is a continuation of Ser. No. 827,634, Aug. 25, 1977, abandoned. This application Mar. 17, 1980, Ser. No. 130,685

Claims priority, application Fed. Rep. of Germany, Aug. 31, 1976, 2639216

Int. Cl.³ B31B *1/16*

U.S. Cl. 493—372 **5 Claims**



1. A method for sequentially severing blanks for packaging, especially cigarette wrappings, from a continuously running web of packaging material in preparation for formation of packagings from the severed blanks, characterized in that:

(a) cutting of the blanks is performed with downward motion of a punch-type cutter with which adjacent blanks are cut with projections arranged 180° with respect to one another on the inside of the cut web,

(b) after cutting of the blanks by the punch-type cutter, the cutter continues in a downward motion to separate the blanks and to lower the blanks from a feed plane to a delivery plane,

(c) one of each two adjacent separated blanks is transported in the feed plane then the other of the two adjacent blanks is rotated through 180° by a turntable, and then the blanks are transported to a packaging station.

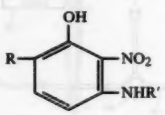
4,330,291

NITRATED COUPLER COMPOUNDS USEFUL IN DIRECT DYEING AND SIMULTANEOUS OXIDATION AND DIRECT DYEING OF KERATINIC FIBERS

Andree Bugaut, 7, rue des Abondances, 92100 Boulogne-Billancourt, and Ginette Jeanminet, 21, rue du Commandant Brasseur, 93600 Aulnay-sous-Bois, both of France

Continuation of Ser. No. 698,126, Jun. 21, 1976, abandoned.
This application Mar. 5, 1980, Ser. No. 127,461
Claims priority, application France, Jun. 26, 1975, 75 20155; Nov. 7, 1975, 75 34208
Int. Cl.³ A61K 7/13
U.S. Cl. 8—406 11 Claims

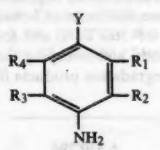
1. An oxidation dye composition for dyeing keratinic fibers comprising in an aqueous medium at least one coupler of the formula



wherein:

R is hydrogen, alkyl or halogen; and

R′ is hydrogen, alkyl, hydroxyalkyl, piperidinoalkyl, acetyl or carbethoxy, said coupler being present in an amount of 0.002 to 2 weight percent of said composition, and at least one oxidation base selected from the group consisting of (a) an oxidation base having the formula



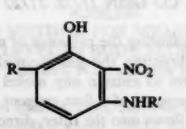
wherein R_1, R_2, R_3 and R_4 each independently are selected from the group consisting of hydrogen, alkyl, halogen and alkoxy; and

Y is selected from the group consisting of hydroxyl and $—NR_5R_6$ wherein R_5 and R_6 each independently are selected from the group consisting of hydrogen, alkyl, hydroxyalkyl, carbamylalkyl, mesylaminoalkyl, aminoalkyl, acylaminoalkyl, sulfoalkyl, morpholinoalkyl and piperidinoalkyl, the said alkyl radicals containing 1–4 carbon atoms; and

(b) a heterocyclic compound selected from the group consisting of 2,5-diamino pyridine and 2-hydroxy-5-amino pyridine; the said oxidation base being in the form of the free base or in the form of an acid addition salt thereof, said oxidation base being present in an amount up to 2 weight percent based on the total weight of said composition.

8. A process for dyeing keratinic fibers comprising successively applying to the said fibers (a) an effective amount of an aqueous solution or hydroalcoholic solution, wherein the alcoholic component comprises 1 to 40 weight percent of the solution,

of as a coupler at least one compound having the formula



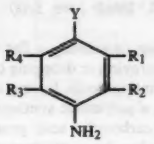
(I)

wherein:

R is hydrogen, alkyl or halogen; and

R′ is hydrogen, alkyl, hydroxyalkyl, piperidinoalkyl, acetyl or carbethoxy;

(b) an effective amount of an aqueous or hydroalcoholic solution, wherein the alcoholic component comprises 1 to 40 weight percent of the solution containing at least one oxidation base selected from the group consisting of (i) an oxidation base having the formula



(II)

wherein R_1, R_2, R_3 and R_4 each independently are selected from the group consisting of hydrogen, alkyl, halogen and alkoxy; Y is selected from the group consisting of hydroxyl and $—NR_5R_6$ wherein R_5 and R_6 each independently are selected from the group consisting of hydrogen, alkyl, hydroxyalkyl, carbamylalkyl, mesylaminoalkyl, aminoalkyl, acylaminoalkyl, sulfoalkyl, morpholinoalkyl and piperidinoalkyl, the said alkyl radicals containing 1–4 carbon atoms, and (ii) a heterocyclic compound selected from the group consisting of 2,5-diaminopyridine and 2-hydroxy-5-amino-pyridine, said oxidation base being in the form of the free base or in the form of an acid addition salt thereof; and (c) an effective amount of an aqueous or hydroalcoholic solution, wherein the alcoholic component is 1 to 40 weight percent of the solution, containing an oxidizing agent, said solution (c) being applied either separately after solutions (a) and (b), or totally or in admixture with the second of said solutions (a) or (b) to be applied; with the proviso that where solution (b) contains an oxidation base which itself develops a color in the presence of an oxidizing agent, solution (a) is applied first.

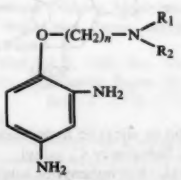
4,330,292

DYEING COMPOSITIONS FOR KERATIN FIBRES CONTAINING META-PHENYLENEDIAMINES

Andree Bugaut, Boulogne; Jean-Jacques M. Vandenbossche; Majdi M. Shahin, both of Aulnay-sous-Bois, and Gregoire Kalopissis, Neuilly-sur-Seine, all of France, assignors to L'Oreal, Paris, France

Filed Dec. 11, 1980, Ser. No. 215,531
Claims priority, application France, Jan. 9, 1980, 80 00390
Int. Cl.³ A61K 7/13; C07C 93/14
U.S. Cl. 8—411 25 Claims

1. A composition suitable for dyeing keratin fibres which comprises, in an appropriate carrier, at least one oxidation base, and as the coupler, at least one compound of the formula (I):



(I)

in which formula n is equal to 2, 3 or 4 and R_1 and R_2 are identical or different and represent an alkyl group having from 1 to 4 carbon atoms, or an acid salt thereof.

4,330,293

DYEING OR PRINTING PROCESS

Wolfgang Lindemann, Inzlingen, Fed. Rep. of Germany, assignor to Sandoz Ltd., Basel, Switzerland

Continuation-in-part of Ser. No. 1,478, Jan. 8, 1979, abandoned. This application Jul. 9, 1980, Ser. No. 167,189

Claims priority, application Fed. Rep. of Germany, Jan. 14, 1978, 2801577

Int. Cl.³ D06P 1/46, 5/00

U.S. Cl. 8—495 21 Claims

1. A process for dyeing or printing a flat form textile substrate which comprises spraying or dropping onto the substrate an aqueous dyeing or printing liquor having a viscosity below 500 cps and comprising a polymeric synthetic thickener precursor which contains carboxylic acid groups in free acid form, the substrate having been pretreated by depositing thereon a gel forming effective amount of a solution of a basic compound selected from ammonia, an alkali metal hydroxide, an amine, an alkali metal carbonate and an alkali metal bicarbonate, the dyeing or printing liquor being converted on contact with said basic compound on the pretreated substrate into a gel having viscosity from 3,000 to 60,000 cps.

4,330,294

ANTHRAQUINONE COMPOUNDS AND PROCESS FOR DYEING THEREWITH

Roland Wald, Huningue, France, assignor to Sandoz Ltd., Basel, Switzerland

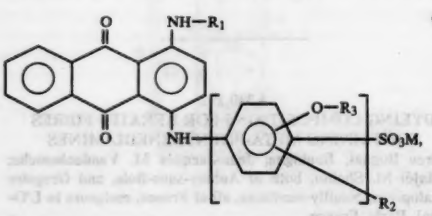
Filed Sep. 26, 1980, Ser. No. 191,077

Claims priority, application Switzerland, Oct. 2, 1979, 8882/79

Int. Cl.³ C09B 1/34; D06P 1/20, 1/40, 3/87

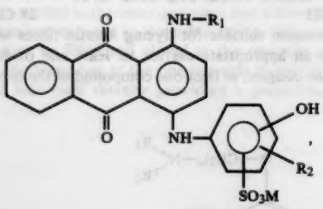
U.S. Cl. 8—643 28 Claims

1. A mixture comprising at least one compound of formula Ia



(Ia)

and at least one compound of formula Ib



(Ib)

in which

each R_1 is an aliphatic or alicyclic hydrocarbon radical,

each R_2 is hydrogen, halogen or C_{1-8}alkyl,

R_3 is C_{1-4}alkyl, phenyl, chlorophenyl or tolyl,

each M is hydrogen or an equivalent of a non-chromophoric cation,

and the R_1's, R_2's and M's, respectively, are the same or different.

4,330,295

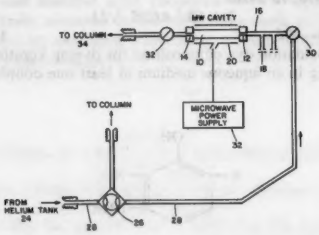
MICROWAVE DISCHARGE DEGRADATION OF ORGANICS FOR ANALYSIS

James W. Taylor, Madison, Wis., and Romer A. Romero, Maracaibo, Zulia, Venezuela, assignors to Wisconsin Alumni Research Foundation, Madison, Wis.

Filed Mar. 5, 1979, Ser. No. 17,420

Int. Cl.³ G01N 22/00, 30/00

U.S. Cl. 23—230 M 4 Claims



1. A method of analysis of organic materials comprising the steps of depositing the organic material to be analyzed as a thin coating on a support located in a central portion of a discharge tube, supporting the said tube in a microwave cavity, exhausting air from the discharge tube, filling the discharge tube with helium gas, subjecting the organic material to a combination of microwave excitation and photon degradation by exposing the material to microwave discharge in helium gas at a pressure within the range of 0.5–500 Torr. and for a time within the range of 0.5–30 seconds, and sweeping the tube with an inert gas for removal of degradation products for separate determination.

4,330,296

ALBUMIN REAGENT AND ASSAY

Chandra P. Jain, Placentia, and Frank R. Shu, Anaheim, both of Calif., assignors to Beckman Instruments, Inc., Fullerton, Calif.

Filed Jun. 23, 1980, Ser. No. 161,833

Int. Cl.³ G01N 21/29, 33/68

U.S. Cl. 23—230 B 6 Claims

1. An albumin reagent of the type comprising bromcresol green, a buffering agent having a buffering capacity in the pH range of about 4 to about 4.2, and polyoxyethylene(23) lauryl ether, characterized in that the reagent contains from about 0.18 to about 0.22 gm/l bromcresol green and has a polyoxyethylene(23) lauryl ether:bromcresol green weight ratio of from about 10:1 to about 12:1.

4,330,297

TEST TUBE CONSTRUCTION AND METHOD FOR MEASURING FOR NICKEL AEROSOLS

Kurt Leichnitz, Gross-Grönau, Fed. Rep. of Germany, assignor to Drägerwerk Aktiengesellschaft, Fed. Rep. of Germany

Filed Sep. 30, 1980, Ser. No. 192,550

Claims priority, application Fed. Rep. of Germany, Oct. 23, 1979, 2942674

Int. Cl.³ G01N 21/78, 31/22

U.S. Cl. 23—232 R 8 Claims

8. A method of measuring the presence of nickel aerosols in a gas, comprising, directing the gas through a testing tube having a filter therein to entrain any nickel particles in the filter, breaking an ampoule of a first reagent material so that the reagent material flows into the filter, directing the reagent material with the entrained filter particles into a reagent layer, breaking a second ampoule to cause a second reagent to flow through a buffer layer and to the reaction layer and thereby

causing a discoloration of the reaction layer, and comparing the discoloration of the reaction layer with a standard color-

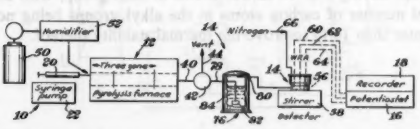
ation for various percentages of nickel content in order to determine the nickel present in the gas.

4,330,298

REDUCTIVE PYROLYSIS METHOD FOR DETERMINING TRACE SULFUR

David D. Hawn, and Robert E. Reim, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Sep. 30, 1980, Ser. No. 192,584
Int. Cl.³ G01N *27/46*
U.S. Cl. 23—230 PC 34 Claims



1. An improved method for the determination of sulfur concentration which comprises the steps of reductive pyrolysis of a sulfur-containing liquid sample to produce H_2S sulfur derivative in pyrolysis effluent gas, in-line collection of the H_2S so evolved from the sample in a base electrolyte solution by bubbling the effluent gas through the electrolyte solution, said method producing a concentration of sulfide in electrolyte solution of less than about 2.5×10^{-5} molar, thereafter detecting the sulfide concentration of the base electrolyte solution by forming a concentrated sulfide layer on the surface of a mercury working electrode in contact with the solution by applying a plating potential to the working electrode vs. a reference electrode, to form a HgS layer on the surface of the working electrode, and thereafter, under conditions of a quiescent solution, scanning the working electrode potential in the cathodic direction to determine as a function of current or a current derivative, total H_2S derivatized sulfur concentration of the analyzed sample.

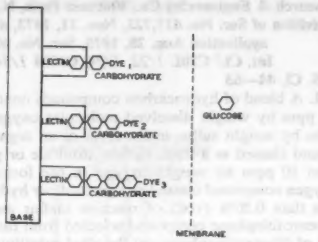
4,330,299

ARTICLE AND METHOD FOR MEASURING GLUCOSE LEVEL IN BODY FLUIDS

Anthony Cerami, Flanders, N.J., assignor to Evreka, Inc., Flanders, N.J.

Filed Mar. 9, 1981, Ser. No. 241,991
Int. Cl.³ G01N *33/66, 33/52, 33/58, 31/22*
U.S. Cl. 23—230 B 21 Claims

1. A method for measuring the level of glucose in animal body fluids comprising placing a sample of said body fluid in contact with a glucose indicator, said indicator comprising a reversible complex of a carbohydrate component, a binding macromolecular component and an indicator element associated with one of said components, maintaining said body fluid in contact with said glucose indicator for a period of time



sufficient for any glucose present in said body fluid to displace said carbohydrate component in a complex with said binding macromolecular component, and for said indicator element to be released thereby to signify the presence and level of said glucose.

4,330,300

COAL OIL MIXTURES

Roger J. R. Cairns, Woking, England, assignor to The British Petroleum Company Limited, London, England

Continuation of Ser. No. 773,170, Mar. 1, 1977, abandoned. This application Aug. 30, 1978, Ser. No. 938,044
Claims priority, application United Kingdom, Mar. 5, 1976, 08880/76
Int. Cl.³ C10L *1/32*
U.S. Cl. 44—51 9 Claims

1. A method for the preparation of a stable coal oil dispersion which is suitable for pumping and storage which method comprises grinding coal in fuel oil medium while excluding air until the particle size of the coal is reduced to a value below 10 micron and the dispersion contains 15 to 55% by weight of coal expressed as a percentage by weight of the total dispersion.

4,330,301

DISPERSANT FOR AQUEOUS SLURRY OF COAL POWDER

Masaaki Yamamura; Noboru Moriyama, and Shin-ichi Watanabe, all of Wakayama, Japan, assignors to Kao Soap Co., Ltd., Tokyo, Japan

Filed Jul. 3, 1980, Ser. No. 165,877
Claims priority, application Japan, Jul. 26, 1979, 54-95173
Int. Cl.³ C10L *1/32*
U.S. Cl. 44—51 7 Claims

1. An aqueous slurry consisting essentially of from 30 to 85% by weight of powdered coal, from 0.01 to 5.0% by weight of dispersant for dispersing said powdered coal in water, said dispersant being a formaldehyde condensate of sulfonated naphthalene material selected from the group consisting of naphthalene sulfonic acid, alkylnaphthalene sulfonic acid, alkenylnaphthalene sulfonic acid, salts of said acids and mixtures thereof, and the balance is essentially water.

4,330,302

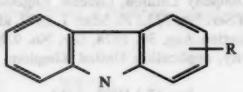
HIGH THERMAL STABILITY LIQUID HYDROCARBONS AND METHODS FOR PRODUCING THEM

William F. Taylor, Mountainside, N.J., assignor to Exxon Research & Engineering Co., Florham Park, N.J.

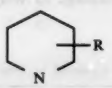
Division of Ser. No. 417,723, Nov. 21, 1973, abandoned. This application Aug. 28, 1975, Ser. No. 608,659
Int. Cl.[3] C10L *1/22, 1/24;* C10M *1/34, 1/38*
U.S. Cl. 44—63 18 Claims

1. A blend of hydrocarbon compounds containing less than 15 ppm by weight dissolved molecular oxygen; less than 10 ppm by weight sulfur in the form of an organic sulfur compound classed as a thiol, sulfide, disulfide or polysulfide; less than 10 ppm by weight oxygen in the form of an organic oxygen compound classed as a peroxide or hydroperoxide, and less than 0.20% (vol.) of reactive olefins and containing a dibenzothiophene compound selected from the group consisting of dibenzothiophene and the alkyl substituted dibenzothiophenes containing 1 to 8 alkyl groups, the alkyl groups containing from 1 to 4 carbon atoms to improve the thermal stability thereof with the total number of carbon atoms in the compound being no greater than 22.

7. A blend of hydrocarbon compounds containing less than 15 ppm by weight dissolved molecular oxygen; less than 10 ppm by weight sulfur in the form of an organic sulfur compound classed as a thiol, sulfide, disulfide or polysulfide; less than 10 ppm by weight oxygen in the form of an organic oxygen compound classed as a peroxide or hydroperoxide, and less than 0.20% (vol.) of reactive olefins and containing an organic nitrogen compound selected from the group consisting of the paraffinic amines, having the general formula RNH_2 where R is an alkyl group having 1 to 22 carbon atoms, the carbazoles having the general formula



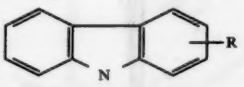
where R can be one or more hydrogen radicals or one or more alkyl groups having from 1 to 12 carbon atoms in each group, with the total number of carbon atoms in the alkyl groups being no greater than 12 and the piperidines having the general formula



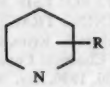
where R is one or more hydrogen radicals or one or more alkyl groups having 1 to 18 carbon atoms in each group, with the total number of carbon atoms in the alkyl groups being not greater than 18 to improve the thermal stability thereof.

12. A blend of hydrocarbon compounds having improved thermal stability containing: less than 15 ppm dissolved molecular oxygen; less than 10 ppm by weight sulfur in the form of an organic sulfur compound classed as a thiol, sulfide, disulfide, or polysulfide; less than 10 ppm oxygen in the form of an oxygen compound classed as a peroxide, hydroperoxide, paraffinic carboxylic acid, phenol or amide; less than 5 ppm by weight nitrogen in the form of an organic nitrogen compound classed as an amide or an alkyl-pyridine; and less than 0.20% (vol.) of a reactive olefin and containing a dibenzothiophene compound selected from the group consisting of dibenzothiophene and the alkyl substituted dibenzothiophenes containing 1 to 8 alkyl groups, the alkyl groups containing from 1 to 4 carbon atoms to improve the thermal stability thereof with the total number of carbon atoms in the compound being no greater than 22.

15. A blend of hydrocarbon compounds having improved thermal stability containing: less than 15 ppm dissolved molecular oxygen: less than 10 ppm by weight sulfur in the form of an organic sulfur compound classed as a thiol, sulfide, disulfide, or polysulfide; less than 10 ppm oxygen in the form of an oxygen compound classed as a peroxide, hydroperoxide, paraffinic carboxylic acid, phenol or amide; less than 5 ppm by weight nitrogen in the form of an organic nitrogen compound classed as an amide or an alkyl pyridine; and less than 0.20% (vol.) of a reactive olefin and containing an organic nitrogen compound selected from the group consisting of the paraffinic amines, having the general formula RNH_2 where R is an alkyl group having 1 to 22 carbon atoms, the carbazoles having the general formula



where R can be one or more hydrogen radicals or one or more alkyl groups having from 1 to 12 carbon atoms in each group, with the total number of carbon atoms in the alkyl groups being no greater than 12 and the piperidines having the general formula



where R is one or more hydrogen radicals or one or more alkyl groups having 1 to 18 carbon atoms in each group, with the total number of carbon atoms in the alkyl groups being not greater than 18 to improve the thermal stability thereof.

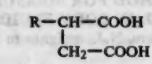
4,330,303

DETERGENT FUEL COMPOSITION

William M. Cummings, Fishkill, and Justin C. Powell, Wappingers Falls, both of N.Y., assignors to Texaco Inc., White Plains, N.Y.

Filed Dec. 16, 1977, Ser. No. 861,462
Int. Cl.[3] C10L *1/22*
U.S. Cl. 44—63 4 Claims

1. A motor fuel composition comprising a mixture of hydrocarbons in the gasoline boiling range containing an effective detergent amount of an additive composition comprising the reaction product obtained by reacting ethylenediamine with an acid lactone reaction product, under amidation conditions at a temperature in the range from above 100° C. to 170° C. employing about one mole of said ethylenediamine per mole of said acid lactone reaction product, said acid lactone reaction product being obtained by reacting an alkenyl succinic acid, represented by the formula:



in which R is an alkenyl radical having an average molecular weight ranging from about 300 to 3000, under substantially anhydrous esterification conditions at a temperature ranging from about 50° to 100° C. in the presence of a protonating agent.

4,330,304

FUEL ADDITIVE

Jeremy W. Gorman, 5 Cedar Hill Rd., West Simsbury, Conn. 06092

Filed May 13, 1981, Ser. No. 263,219
Int. Cl.³ C10L 1/22
U.S. Cl. 44—63 9 Claims

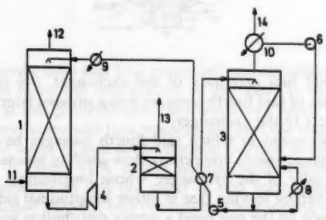
1. A fuel additive to improve liquid fuel combustion efficiency which comprises:
a nitroparaffin which is between 3% and 65%, by weight, of the entire additive;
a hydroperoxide which is between ¼% and 15%, by weight, of the entire additive; and
propylene oxide which is between 1% and 20%, by weight, of the entire additive.

4,330,305

REMOVAL OF CO_2 AND/OR H_2S FROM GASES

Klaus Kuessner, Frankenthal; Rudolf Irnich, Bobenheim; Hans-Georg Scharpenberg, Hagen, and Klaus Volkamer, Frankenthal, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 775,319, Mar. 7, 1977, abandoned. This application Jun. 5, 1978, Ser. No. 912,355
Claims priority, application Fed. Rep. of Germany, Mar. 19, 1976, 2611613
Int. Cl.³ B01D 53/14
U.S. Cl. 55—48 5 Claims



1. A process for removing H_2S or CO_2 or both from a gaseous mixture containing H_2S or CO_2 or both which comprises washing the gases under pressure with a solvent comprising polyethylene glycol methyl isopropyl ethers containing from 3 to 7 [$—CH_2CH_2—O—$] units, with subsequent regeneration of the solvent.

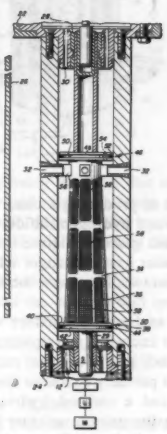
4. A process for removing H_2S or CO_2 or both from gaseous mixture containing H_2S or CO_2 or both which comprises
(a) contacting said gaseous mixture in a first zone with a solvent comprising a mixture of polyethylene glycol methyl isopropyl ethers containing from 3 to 7 [$—CH_2CH_2—O—$] units to effect absorption of substantially all of the H_2S or CO_2 or both and a minor portion of other gases,
(b) passing the solvent containing the absorbed gases to a second zone maintained at a pressure substantially lower than that in the absorption zone to effect liberation of at least a portion of the absorbed gases,
(c) withdrawing from said second zone gases liberated therein,
(d) withdrawing solvent containing H_2S or CO_2 or both from said second zone,
(e) and introducing the solvent to a third zone to effect removal of substantially all of the H_2S or CO_2 or both therefrom by heating the solvent or by stripping with steam or inert gases or by heating and stripping,
(f) returning at least a portion of the desorbed solvent to the top of the absorption zone after adjusting the water content to not more than 8% by weight, based on the solvent, if steam has been added to the solvent in step (e).

4,330,306

GAS-LIQUID SEPARATOR

Richard F. Salant, Arlington Heights, Ill., assignor to Centrilift-Hughes, Inc., Claremore, Okla.

Continuation-in-part of Ser. No. 620,666, Oct. 8, 1975, abandoned. This application Oct. 17, 1977, Ser. No. 843,019
Int. Cl.³ B01D 19/00
U.S. Cl. 55—159 2 Claims



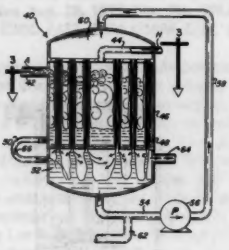
1. A separator assembly for separating gas and any particulate material from a flowable mixture of liquid, gas and any particulate material which assembly is adapted to be associated with a motor and a pump having a pump inlet and being driven by said motor for pumping the liquid therefrom comprising:
a housing having a pair of spaced ends;
an inlet to one end of said housing communicating with a source of said flowable mixture;
an outlet from the other end of said housing adapted to be in communication with said pump inlet for the passage of liquid from the separator assembly to said pump;
outlet means for the flow of separated gas and any particulate material from said housing together with a small amount of bleed liquid;
a stationary generally conical-shaped multipored member in said housing having its basel end spanning the housing and maintained in sealed relation with respect to the interior walls thereof and its other end generally centrally located in said housing;
one end of said multi-pored member being an entry end for said flowable mixture and the other end being an exit end;
said outlet means being connected to said exit end of said multipored member;
said multi-pored member being so disposed in said housing to intersect the flow of all mixture which flows into and through said inlet and to said entry end having pores of such dimensions to permit the passage therethrough of said liquid while trapping gas in the form of bubbles and any particulate material, said trapped bubbles of gas and any particulate material being moved and swept along said multi-pored member in the general direction of continuous mixture flow and to said exit end and through said outlet means.

4,330,307

METHOD OF SEPARATING A NONCONDENSABLE GAS FROM A CONDENSABLE VAPOR

Glenn E. Coury, 6600 W. 13th Ave., Lakewood, Colo. 80214

Filed Apr. 7, 1980, Ser. No. 138,007
Int. Cl.³ F25J 3/00
U.S. Cl. 62—23 5 Claims



1. The method of producing a clean water from a gaseous mixture of steam and hydrogen sulfide, comprising:

(a) directing said gaseous mixture into a bottom of a shell side of a tubular heat exchanger wherein the tubes define an intermediate wall between the shell and the tube side thereof;

(b) contacting said gaseous mixture with said intermediate wall for heat exchange and upward flow along a baffled path in the shell side of the heat exchanger under suitable conditions to partially condense the mixture into a water condensate and a residual hydrogen sulfide-containing gas, wherein the gaseous mixture is contacted with the intermediate wall along a flow path such that the condensate is drawn by gravity substantially in opposition to the direction of gas flow;

(c) removing said hydrogen sulfide-containing residual gas from the heat exchanger through a first exit at the top of the heat exchanger at the termination of the flow path;

(d) removing said water condensate from the shell side of the heat exchanger from a second exit substantially at the bottom of the shell side of the heat exchanger;

(e) flash evaporating a portion of the water condensate removed from the shell side of the heat exchanger;

(f) contacting the residual flashed water condensate from said flash evaporating process with the intermediate well on the tube side of the heat exchanger at the top of the tube side for gravity flow on the tube side and for heat exchange through the wall and simultaneous partial vaporization of the condensate on the tube side of the heat exchanger into a vapor containing residual hydrogen sulfide from the flashed water condensate and a clean water condensate having lower hydrogen sulfide content than said gaseous mixture; and

(g) removing said clean water condensate from the tube side of the heat exchanger separate from said vapor containing residual hydrogen sulfide from the flashed water condensate.

4,330,308

PLATE-TYPE HEAT EXCHANGERS

Maurice Grenier, Paris, and Pierre Petit, Chatenay-Malabry, both of France, assignors to L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude, Paris, France

Filed May 1, 1980, Ser. No. 145,814
Claims priority, application France, May 18, 1979, 79 12727
Int. Cl.³ F25J 3/00
U.S. Cl. 62—40 23 Claims

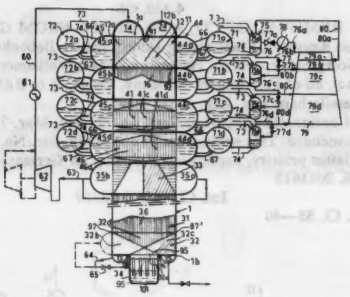
1. In a plate-type heat exchanger comprising a plurality of rectangular plates stacked and joined together with sealed mutual spacing along the thickness of the exchanger to form at least:

(a) a plurality of first passages for the cooling of a refrigerating mixture;

(b) a plurality of second passages for the cooling of a gas which is to be processed, said first and second passages having inlets at a first longitudinal extremity of the exchanger and outlets at least close to a second longitudinal extremity of the exchanger;

(c) a plurality of third passages for heating the refrigerating mixture having outlets which are laterally situated at a distance from said first extremity of the exchanger; and

(d) a plurality of fourth passages arranged in longitudinal extensions left free by said third passages, extending longitudinally from the outlet extremity of said third passages



to said first extremity of the exchanger, the inlets and outlets of said fourth passages being situated laterally with respect to the exchanger;

the improvement in which said fourth passages have active heat exchange spaces comprising flow-guiding means directed longitudinally of the exchanger whose longitudinal extent is limited, thereby leaving free at either longitudinal side of said active space on the one hand a supply distribution space comprising flow-guiding means, and on the other hand a discharge distribution space comprising flow-guiding means, said supply and discharge flow-guiding means leading respectively into the inlets and outlets of said fourth passages, said inlets and outlets of said fourth passages being so disposed that fluid flows in said fourth passages toward said first longitudinal extremity of the exchanger.

4,330,309

HEAT PUMP WATER HEATER

Glen P. Robinson, Jr., 1050 Mt. Paran Rd. NW., Atlanta, Ga. 30327

Continuation of Ser. No. 49,430, Jun. 18, 1979. This application Aug. 25, 1980, Ser. No. 180,702
Int. Cl.³ F25D 17/00; G05D 23/00
U.S. Cl. 62—181 10 Claims

1. A water heater construction for storing hot water at the normal predetermined tank temperature associated with hot water heaters including:

a water tank having an upper end, a lower end, and a cold water supply for supplying cold water to the lower end of said water tank;

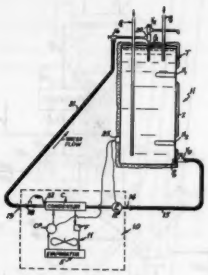
a heat pump having condenser heat exchanger externally of said water tank;

circulation pump means for pumping water from the lower end of said water tank through the condenser heat exchanger to heat the water and back into the upper end of said water tank;

a variable flow control valve operatively connecting the condenser heat exchanger to the upper end of said water tank so that water pumped through the condenser heat

exchanger is returned to the upper end of said water tank through said variable flow control valve, said variable flow control valve responsive to the temperature of the water in the condenser heat exchanger to regulate the flow of water from the condenser heat exchanger to the upper end of said water tank so that the water returned to the upper end of said water tank is at least at a predetermined return water temperature sufficient for immediate use but below the normal predetermined tank temperature; and

thermostatic control means responsive to the temperature of the water at a predetermined position in said water tank and operatively connected to both said heat pump and said circulation pump means, said thermostatic control means set at the normal predetermined tank temperature



to operate both said heat pump and said circulation pump means when the temperature of the water in said water tank at said predetermined position drops below the normal predetermined tank temperature until the temperature of the water at said predetermined position in said water tank is raised back to the normal predetermined tank temperature so that the water in said water tank is first circulated through said condenser heat exchanger to heat the water to said predetermined return water temperature until substantially all of the water in said water tank is at least at said predetermined return water temperature and then further circulated through said condenser heat exchanger to heat the water above said predetermined return water temperature until the water in said water tank has been heated to the normal predetermined tank temperature at said predetermined position.

4,330,310

PLASTIC MULLION RAIL ASSEMBLY FOR REFRIGERATOR

Ralph Tate, Jr., Center Township, Vanderburgh County; John T. Woods, Scott Township, Vanderburgh County, and Joseph G. Schapker, German Township, Vanderburgh County, all of Ind., assignors to Whirlpool Corporation, Benton Harbor, Mich.

Filed Aug. 22, 1980, Ser. No. 180,491
Int. Cl.³ F25D *21/06*; A47B *81/00*
U.S. Cl. 62—275 **21 Claims**

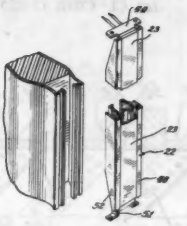
1. In a refrigeration apparatus having a cabinet defining an internal space and including opposite spaced walls and mullion wall means extending between said spaced walls for dividing said space into compartments, said mullion wall means defining an outer edge portion, an improved mullion rail assembly comprising:

means on said outer edge portion of the mullion wall means defining first securing means;

an elongated member formed of a thermal insulating material overlying said edge portion to define an insulating outer mullion rail and having second securing means releasably fitted to said first securing means to retain said elongated member against movement away from said mullion wall means;

means for securing said elongated member at one end thereof to said cabinet adjacent one of said spaced walls;

an outwardly exposed elongated strip of magnetically attractable material on said mullion rail, the transverse



extent of said strip being less than that of said insulating elongated member and said strip being spaced inwardly from the lateral side edges of the insulating elongated member whereby said strip is insulated from said compartments; and

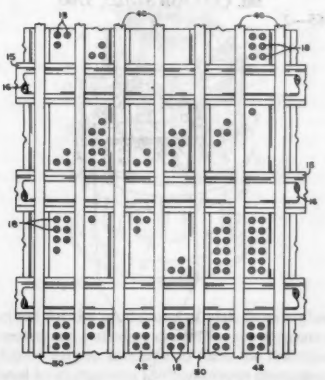
means for securing said elongated strip at one end thereto to said cabinet adjacent the other of said spaced walls.

4,330,311

HIGH PRESSURE FORMING BUSHING AND FIN COOLER

Thomas H. Jensen, Murrysville, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Oct. 2, 1980, Ser. No. 193,197
Int. Cl.³ C03B *37/025*
U.S. Cl. 65—1 **17 Claims**



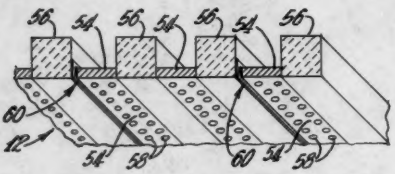
2. A bushing for high pressure glass fiber forming apparatus, said bushing comprising spaced sloping sidewalls, said sidewalls being carried by a frame secured by said apparatus, a tip plate extending generally horizontally between said sidewalls, said tip plate carrying a plurality of nozzles through which said glass is forced to form filaments, cooperating corrugations and recesses formed on said tip plate, said corrugations on tip plate including valleys and crests with the plurality of nozzles being carried on said crests and the recesses on said tip plate being transverse to said corrugations, said corrugations and recesses thereby increasing the strength of said tip plate.

4,330,312

APPARATUS FOR FLOWING STREAMS OF FIBER-FORMING MATERIAL FOR ATTENUATION TO FIBERS OR FILAMENTS

Robert L. Hill, Pataskala, Ohio, assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Nov. 3, 1980, Ser. No. 203,297
Int. Cl.³ C03B 37/025
U.S. Cl. 65—1 17 Claims



1. Apparatus for delivering streams of heat-softened glass comprising a body of refractory having a cavity containing heat-softened glass, a floor construction associated with the body of refractory, said construction including a plurality of platinum alloy sections arranged in spaced relation, each section having orifices for flowing glass streams from the glass in the cavity of the refractory body, members of refractory disposed between the platinum alloy sections, the platinum alloy sections being in sealing relation with the members of refractory.

4,330,313

PREHEAT HOPPER AGITATORS

Charles M. Hohman, Granville; Mark A. Propster, Gahanna, and Stephen Seng, Frazeysburg, all of Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Nov. 24, 1980, Ser. No. 209,787
Int. Cl.³ C03B 37/025, 3/00
U.S. Cl. 65—2 8 Claims

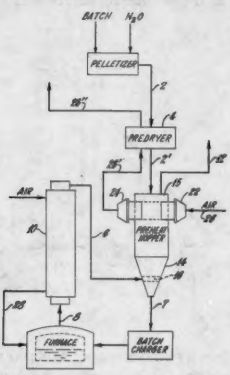
1. Apparatus for preheating glass batch pellets comprising:
(a) a chamber having an upper operating pellet level;
(b) a lower gas inlet opening into and an upper gas outlet opening from said chamber;
(c) an upper pellet inlet and a lower pellet outlet from said chamber; and,
(d) agitator means positioned within the upper portion of said chamber proximately coincident with said upper operating pellet level and comprising a plurality of rotatable members extending across a principal portion of the area of said chamber, said agitator being rotatable by drive means on a time sequence basis.

4,330,314

APPARATUS AND PROCESS FOR PREDRYING AND PREHEATING GLASS BATCH AGGLOMERATES BEFORE MELTING

Mark A. Propster, Gahanna; Stephen Seng, Frazeysburg, and Charles Hohman, Granville, all of Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Nov. 12, 1980, Ser. No. 206,325
Int. Cl.³ C03B 3/00
U.S. Cl. 65—27 8 Claims



1. A process for producing glass by charging to a melting furnace and melting therein a glass batch, comprising the steps of agglomerating the batch using a liquid, drying the wet agglomerates, charging the dried agglomerates onto the upper surface of a vertical bed preheat hopper having a lower discharge end communicating with the furnace, withdrawing agglomerates through said lower discharge end for charging to the furnace, moving the remaining agglomerates by gravity downwardly through the bed, passing hot furnace exhaust gases upwardly through the bed to heat the agglomerates therein, indirectly extracting heat from said exhaust gases in the preheat hopper and employing the indirectly extracted heat in the step of drying the wet agglomerates.

4,330,315

METHOD AND APPARATUS FOR PREHEATING PULVEROUS MATERIALS PRIOR TO THEIR INTRODUCTION INTO A MELTING FURNACE

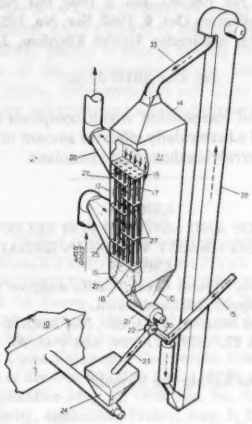
Frederick J. Nelson, Swanton; Raymond S. Richards, Sylvania, and Robert R. Rough, Sr., Toledo, all of Ohio, assignors to Owens-Illinois, Inc., Toledo, Ohio

Continuation-in-part of Ser. No. 183,655, Sep. 2, 1980, abandoned. This application Dec. 5, 1980, Ser. No. 213,766
The portion of the term of this patent subsequent to Aug. 25, 1998, has been disclaimed.
Int. Cl.³ C03B 3/00
U.S. Cl. 65—27 32 Claims

1. The process of continuously preheating glass batch prior to its delivery to a glass melting furnace comprising the steps of introducing the fully-intermixed glass batch constituents into the upper region of a tubular heat exchanger, allowing the glass batch to flow downwardly by gravity through a plurality of open-ended tubes of said heat exchanger, passing hot gases upwardly through said heat exchanger around said open-ended tubes to heat the glass batch contained therein by counter-current indirect heat transfer, during the normal continuous process separating a minor portion of the heated glass batch from

the major portion thereof adjacent the bottom of said heat exchanger and returning said minor portion to the upper region of said heat exchanger for recirculation, and delivering the major portion of said heated glass batch from the bottom of said heat exchanger into the glass melting furnace.

10. Combined apparatus for continuously preheating glass furnace batch comprising an elongated vertically-mounted heat exchanger having a plurality of open-ended tubes extending throughout a major portion of its height, means for delivering glass batch in fully intermixed condition to an upper region of said heat exchanger for its passage by gravity through said



open-ended tubes, means for introducing hot gases from said glass furnace into a lower region of said heat exchanger to circulate upwardly between the said open-ended tubes, baffle means mounted around said tubes to direct said hot gases in a circuitous path around said tubes and out of contact with said glass batch for indirect heat transfer, and means for separating a minor portion of said glass batch from the major portion thereof during the normal continuous process and returning said minor portion to the said upper region of said heat exchanger, the major portion of said glass batch being delivered to a batch charger of said glass furnace.

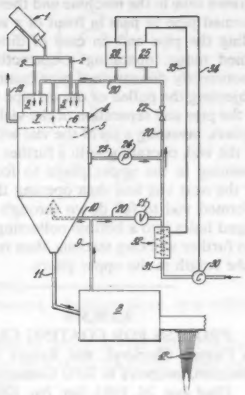
4,330,316

METHOD OF PREHEATING GLASS PELLETS

Charles M. Hohman, Granville; Mark A. Propster, Gahanna, and Stephen Seng, Frazeysburg, all of Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Dec. 15, 1980, Ser. No. 216,464
Int. Cl.³ C03B *3/00*
U.S. Cl. 65—27 **5 Claims**

1. A process for preheating glass pellets which comprises:
(a) introducing wet pellets into a predryer;
(b) introducing a first stream of hot gases comprising hot combustion gases and air into said predryer, the temperature of said air being controlled responsive to the temperature of said first stream, the quantity of said air being controlled responsive to the dew point of said first stream;
(c) passing said pellets and said first stream concurrently downward into a hopper to form a downwardly moving bed of pellets;
(d) passing a second stream of hot gases upwardly into said hopper countercurrently to said downwardly moving bed of pellets; and,



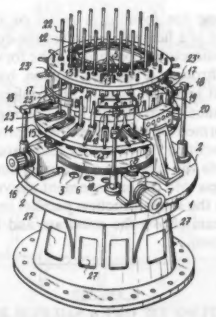
(e) withdrawing gases from the upper portion of said hopper and preheated pellets from the lower portion of said hopper.

4,330,317

METHOD AND MACHINE FOR MAKING VIALS FROM GLASS TUBING

Ermanno Vertova, Via Casnida, n° 2, 24047 Treviglio (Bergamo), Italy

Filed Nov. 6, 1980, Ser. No. 204,448
Claims priority, application Italy, Nov. 27, 1979, 2936 A/79
Int. Cl.³ C03B *23/08, 23/09, 23/11*
U.S. Cl. 65—29 **7 Claims**



1. A method for the production of vials from a glass tubing which is heated and pulled or drawn for the separation therefrom of shaped lengths intended to form the individual vials, characterized by comprising the continuous operating steps of loading at least one closed bottom glass tube on an upper rotatable plate, having holes circumferentially passing therethrough, and causing the tube to move down on a bearing cap, and then gripping the tube by upper and lower pliers, provided offset or staggered with respect to the upper rotatable plate and a lower rotatable plate, continuously rotating the tube on itself by means of rotating elements of said pliers and causing the tube to rotate on the entire circumference of a machine by rotation of said rotatable plates, passing the tube in front of a series of burners having the flames thereof arranged according to a circular or parabolic sector, softening the portions of the tubing confronting the flames of the burners, pulling or draw-

ing the tube downward to form a pipe at the flame softened portion, forming a neck at the bottom portion of said pulled or drawn pipe by passage in front of a further burner, cooling the pulled or drawn tube in the machine and then causing said tube with the formed pipe to pass in front of a mechanical feeling station feeling the pipe and, in case of dimensions outside a predetermined range, operating a correcting burner which heats the incorrectly dimensioned pipe causing the narrowing thereof, subjecting the pulled or drawn pipe to a burner sector for cutting the pipe and separation of the vial which remains in the lower pliers, investing a tip of the vial with a flame to form the inlet of the vial, operating with a further flame on the tube length remaining in the upper pliers to form a new closed bottom for the next vial and then opening the lower pliers to point the formed vial to fall down through the circumferentially arranged holes into a bottom collecting means for transportation to further working stations, then resuming the cycle with the tube length in the upper pliers.

4,330,318

PROCESS FOR COATING GLASS

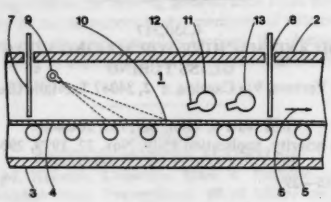
Albert Van Cauter, Charleroi, and Robert Terneu, Thimeon, both of Belgium, assignors to BFG Glassgroup, Paris, France

Filed Jan. 26, 1981, Ser. No. 228,233

Claims priority, application United Kingdom, Jan. 31, 1980, 8003359

Int. Cl.³ C03C *17/10, 17/25*

U.S. Cl. 65—60 C **25 Claims**



1. In a process for forming a metal or metal compound coating on a face of a heated glass substrate during its displacement in a given direction, constituting the forward direction of displacement, through a coating station by contacting the substrate with at least one stream of droplets composed of at least one substance from which said coating metal or metal compound is formed on said face, the improvement wherein said stream is inclined downwardly and parallel to the given direction towards the substrate and comprising discharging at least one jet of gas into the environment above the substrate so that it travels in the same direction parallel to the given direction as said stream above the substrate and impinges against said droplet stream.

4,330,319

MANUFACTURE OF UREA SULFUR FERTILIZER

Stewart G. Bexton; Gordon C. Hildred, both of Calgary; John T. Higgins, Trail, and James G. Whitham, Calgary, all of Canada, assignors to Cominco Ltd., Vancouver, Canada

Filed Jan. 5, 1981, Ser. No. 222,466

Claims priority, application Canada, Dec. 24, 1980, 367550

Int. Cl.³ C05C *9/00*

U.S. Cl. 71—28 **13 Claims**

1. A process for the production of a urea sulfur fertilizer by mixing urea and molten sulfur to obtain a molten mixture and solidifying the molten mixture to obtain a particulate urea sulfur fertilizer comprising passing the molten urea and the molten sulfur through a mixing device at a temperature above the melting points of the molten urea and the molten sulfur in amounts sufficient to produce said urea sulfur fertilizer, maintaining a pressure drop across said mixing device of at least about 200 kPa to form a homogenized melt of urea sulfur, and solidifying said homogenized melt to obtain a homogeneous, solid, particulate urea sulfur fertilizer wherein the sulfur has particle sizes of smaller than about 100 micron.

13. A homogeneous, solid, particulate urea sulfur fertilizer comprising a uniform dispersion of finely divided particles of sulfur in a urea matrix, said sulfur having particle sizes which are smaller than about 100 micron.

4,330,320

HERBICIDAL TETRAHYDROFURAN DERIVATIVES

Michael D. Barker, Sittingbourne, England, assignor to Shell Oil Company, Houston, Tex.

Division of Ser. No. 109,382, Jan. 3, 1980, Pat. No. 4,289,884. This application Oct. 9, 1980, Ser. No. 195,453

Claims priority, application United Kingdom, Jan. 8, 1979, 7900613

Int. Cl.³ A01N *43/40*

U.S. Cl. 71—94 **3 Claims**

1. A herbicidal composition which comprises at least one inert carrier and a herbicidally effective amount of 2,2-dimethyl-5-ethyl-5-(2-pyridylmethoxymethyl-oxolane.

4,330,321

COMPOUNDS AND METHOD FOR SELECTIVELY CONTROLLING GRASSY WEEDS IN BROADLEAVED CROPS

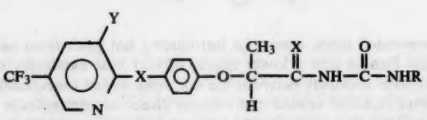
Howard Johnston, Walnut Creek, Calif., assignor to The Dow Chemical Company, Midland, Mich.

Filed Mar. 16, 1981, Ser. No. 244,374

Int. Cl.³ C07D *213/64;* A01N *43/40*

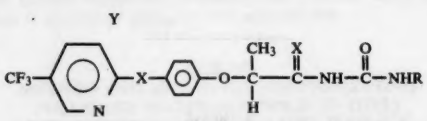
U.S. Cl. 71—94 **9 Claims**

1. A compound having the formula



wherein Y is hydrogen, chloro or bromo; X is O or S, and R is an alkyl or chlorosubstituted alkyl radical having from 1 to 6 carbon atoms.

7. A method for controlling undesired plant growth which consists essentially of applying a herbicidally effective amount of a compound having the formula



wherein Y is hydrogen, chloro or bromo; X is O or S, and R is an alkyl or chlorosubstituted alkyl radical having from 1 to 6 carbon atoms in admixture with an inert adjuvant therefor.

4,330,322

N-(ARYLTHIOCARBAMOYL)-2-AMINO-1H-ISOINDOLE-1,3,-(2H) DIONE PLANT GROWTH REGULATORS

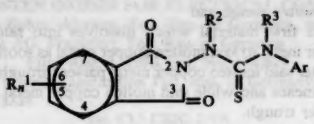
Natu R. Patel, and Jerry L. Rutter, both of Overland Park, Kans., assignors to Gulf Oil Corporation, Pittsburgh, Pa.

Division of Ser. No. 113,861, Feb. 5, 1980, Pat. No. 4,264,502, which is a continuation-in-part of Ser. No. 19,065, Mar. 9, 1979, abandoned. This application Dec. 11, 1980, Ser. No. 215,297

Int. Cl.³ A01N *43/38*

U.S. Cl. 71—96 **5 Claims**

1. The method of regulating the growth of plants comprising applying to the plants, the seed or the soil an effective amount of a compound having the structural formula:



wherein

R^1 is C_1 to C_4 alkyl, nitro or halo and n is zero or an integer from 1 to 4;

R^2 and R^3 are H or C_1 to C_4 alkyl, or benzyl; and

Ar is adamantyl, C_3 to C_4 alkyl or alkenyl, benzyl, halobenzyl, naphthyl, phenyl or phenyl bearing thereon from one to three of the substituents: cyano, benzyloxy, nitro, bromo, chloro, trifluoromethyl and C_1 to C_4 alkyl, alkenyl, alkoxy, alkylthio and alkyl-substituted amino.

4,330,323

DICHLOROACETAMIDE AND TRICHLOROACETAMIDE DERIVATIVES WHICH ARE ANTIDOTES AGAINST HERBICIDES

Bernard S. J. M. Gorny, Eybens; Jean-Paul Brun, Echirolles; Gerard E. M. Boutemy, Milly La Foret, and Michel L. Devif, Chailly en Biere, all of France, assignors to PCUK Produits Chimiques Ugine Kuhlmann, Courbevoie, France

Continuation of Ser. No. 930,086, Aug. 1, 1978, abandoned. This application May 25, 1979, Ser. No. 42,478

Claims priority, application France, Aug. 3, 1977, 77 23866

Int. Cl.³ A01N *37/00, 43/48, 43/64*

U.S. Cl. 71—100 **6 Claims**

1. A composition containing 0.9% to 50% by weight of an antidote product and 1% to 90% by weight of a herbicide belonging to the families of chloroacetanilides, ureas, triazines, carbamates, uracils or thiolcarbamates, the ratio by weight

$$\frac{\text{antidote product}}{\text{herbicide}}$$

being between 0.001 and 10 and the complement to 100% being constituted by inert additives, in which the antidote product is a member selected from the group consisting of N-[(2,2-dichloro-1-isobutyramido)-ethyl]-dichloroacetamide, N-[(2,2,2-trifluoro-1-dichloroacetamido)-ethyl]-dichloroacetamide and N-[(2,2-dichloro-1-amino)-ethyl]-dichloroacetamide.

4,330,324

HERBICIDAL 4-TRIFLUOROMETHYL 4-NITRODIPHENYL ETHERS

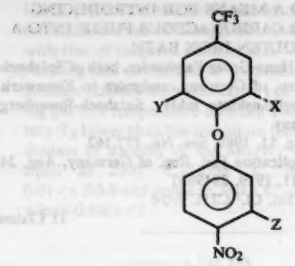
Horst O. Bayer, Levittown; Colin Swithenbank, Perkasie, and Roy Y. Yih, Doylestown, all of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Division of Ser. No. 881,227, Feb. 22, 1978, Pat. No. 4,220,468, and a continuation-in-part of Ser. No. 617,562, Sep. 29, 1975, Pat. No. 4,046,798, which is a division of Ser. No. 331,719, Feb. 12, 1973, Pat. No. 3,928,416, which is a continuation-in-part of Ser. No. 234,651, Mar. 14, 1972, Pat. No. 3,798,276, said Ser. No. 881,227, is a division of Ser. No. 719,484, Aug. 31, 1976, Pat. No. 4,093,446, which is a continuation-in-part of Ser. No. 617,560, Sep. 29, 1975, Pat. No. 4,063,929. This application Jan. 14, 1980, Ser. No. 111,560

Int. Cl.³ A01N *37/34*; C07C *121/75*

U.S. Cl. 71—105 **13 Claims**

1. A compound of the formula



wherein

X is a cyano group,

Y is a hydrogen atom, a halogen atom, or a trifluoromethyl group, and

Z is a (C_1–C_4) alkoxy group having one or more hydrogen atoms replaced by a (C_2–C_4)alkenyl group or a (C_2–C_4)alkynyl group.

10. A method of controlling weeds which comprises applying to the surface of the growth medium prior to the emergence of the weeds from the growth medium a compound according to claim 1 in an amount sufficient to control the growth of the weeds.

4,330,325

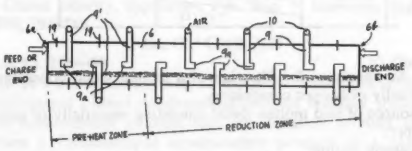
DIRECT REDUCTION ROTARY KILN WITH IMPROVED AIR INJECTION

Vitie P. Keran, and Alan C. Baker, both of Harriman, Tenn., assignors to The Direct Reduction Corporation, New York, N.Y.

Division of Ser. No. 51,017, Jun. 22, 1979, Pat. No. 4,273,314. This application Jan. 12, 1981, Ser. No. 224,151

Int. Cl.³ C21B *13/08*

U.S. Cl. 75—36 **9 Claims**



1. A method for introducing an oxygen-containing gas into a rotary kiln for the direct reduction of materials containing iron oxides using a solid carbonaceous reducing agent as the source of reductant and fuel, the kiln having a preheat zone toward the charge feed end through which some of the reducing agent is added and a reduction zone toward the discharge end through which the remainder of the reducing agent is added and wherein the combustion gases within the kiln flow toward and exhaust through the charge feed end, comprising the steps of injecting the oxygen-containing gas under pressure axially along the length of the kiln and directing said gas injected into at least the first part of the preheat zone toward the charge feed end concurrent with the combustion gases while directing the remainder of said gas injected into the kiln in the direction of the discharge end countercurrent to the combustion gases.

4,330,326
METHOD AND A MEANS FOR INTRODUCING CLOSE-GRAINED CARBONACEOUS FUELS INTO A MOLTEN IRON BATH

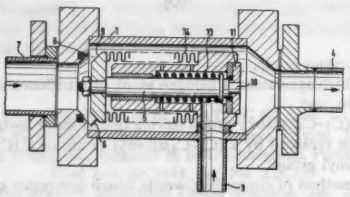
Karl Brotzmann, and Hans-Georg Fassbinder, both of Sulzbach-Rosenberg, Fed. Rep. of Germany, assignors to Eisenwerk-Gesellschaft Maximilianshütte mbH., Sulzbach-Rosenberg, Fed. Rep. of Germany

Filed Aug. 11, 1980, Ser. No. 177,162

Claims priority, application Fed. Rep. of Germany, Aug. 24, 1979, 2934333; Dec. 11, 1979, 2949801

Int. Cl.³ C21C *5/34*

U.S. Cl. 75—60 **11 Claims**



1. A method for introducing close-grained carbonaceous fuels, which are suspended in a carrier gas, and oxygen into a molten iron bath below the surface of the iron bath through the same supply passage of tuyeres arranged in the fire-resistant brickwork of the treatment vessel, comprising alternately introducing said carbonaceous fuel suspended in a carrier gas and said oxygen into said molten iron bath through the said supply passage in said tuyeres.

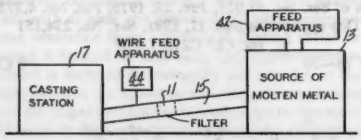
4,330,327
DISPOSABLE BED FILTER PROCESS AND APPARATUS

Michael J. Pryor, Woodbridge, Conn., assignor to Olin Corporation, New Haven, Conn.

Filed Oct. 24, 1980, Ser. No. 200,342

Int. Cl.³ C22B *15/14, 9/02*

U.S. Cl. 75—76 **33 Claims**



3. An apparatus for filtration of a molten metal consisting essentially of copper comprising:

a source of said molten metal consisting essentially of copper;

a casting station;

sump-free transfer trough means for conveying a flow of said molten metal from said source to said casting station in a desired direction; and

bed filter means for removing particulate matter from said molten metal located within the confines of said trough means, said bed filter means comprising layers of different sized granular material overlapped longitudinally in the direction of said metal flow.

29. A process for producing a copper metal or alloy from a source of molten metal consisting essentially of copper comprising:

providing a station for casting said copper metal or alloy and a transfer trough connecting said source and said casting station;

providing bed filter means in said transfer trough;

passing said molten copper metal through said bed filter means which simultaneously reduces the oxygen content of said molten metal and removes particulate matter from said molten metal; and

adding a first material which dissolves into said molten copper metal to said molten copper metal as soon as possible after said molten copper metal passes through said bed filter means and while said molten copper metal is in said transfer trough.

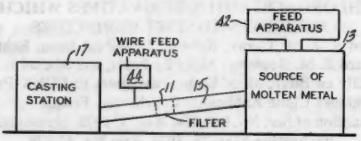
4,330,328
PROCESS AND APPARATUS FOR MAKING A METAL ALLOY

Derek E. Tyler, Cheshire; Harvey P. Cheskis, North Haven; Louis P. Stone, Naugatuck, and Michael J. Pryor, Woodbridge, all of Conn., assignors to Olin Corporation, New Haven, Conn.

Filed Oct. 24, 1980, Ser. No. 200,361

Int. Cl.³ C22B *15/14, 9/02*

U.S. Cl. 75—76 **13 Claims**



1. A process for producing a copper metal or alloy from a source of molten metal consisting essentially of copper comprising:

adding a first reactive material to said molten copper metal to react with oxygen in said molten copper metal to form oxide particles;

providing a station for casting said molten copper metal and means for transferring said molten copper metal from said source to said casting station;

filtering said molten copper metal passing through said transferring means to remove said oxide particles; and

adding a second material which dissolves into said molten copper metal to said molten copper metal after the step of filtering and while said molten copper metal is still in said transferring means.

4,330,329
GOLD BONDING WIRE FOR SEMICONDUCTOR ELEMENTS AND THE SEMICONDUCTOR ELEMENT

Shozo Hayashi, Tokorozawa, and Susumu Tomiyama, Mitaka, both of Japan, assignors to Tanaka Denshi Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 17, 1980, Ser. No. 160,302

Claims priority, application Japan, Nov. 28, 1979, 54-153995; Dec. 19, 1979, 54-166146; Dec. 19, 1979, 54-166147; Feb. 15, 1980, 55-18315; Feb. 15, 1980, 55-18316

Int. Cl.³ C22C *5/00*

U.S. Cl. 420—511 **15 Claims**

1. A bonding gold wire for semiconductor elements comprising a gold alloy containing 2 to 80 ppm by weight of Ag, 5 to 80 ppm by weight of Ge, 1 to 20 ppm by weight of Ca, 0.5 to 10 ppm by weight of Fe, and 0.5 to 30 ppm by weight of Mg, with the substantial balance being gold.

4,330,330

WORK MATERIAL OF SILVER WITH TIN AND TUNGSTEN OXIDES FOR ELECTRICAL CONTACT

Wolfgang Bohm, Alzenau, Fed. Rep. of Germany, assignor to Degussa AG, Frankfurt, Fed. Rep. of Germany

Filed Aug. 4, 1980, Ser. No. 174,827

Claims priority, application Fed. Rep. of Germany, Aug. 17, 1979, 2933338

Int. Cl.³ C22C 5/06

U.S. Cl. 148—430 8 Claims

1. A material suitable for use in electrical switches consisting essentially of 8–20 weight % tin oxide, 0.05–5 weight % tungsten oxide, balance silver.

4,330,331

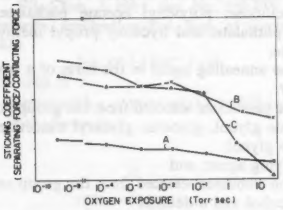
ELECTRIC CONTACT MATERIAL AND METHOD OF PRODUCING THE SAME

Koichi Fujiwara; Goro Yamauchi; Kishio Arita, and Shigeyuki Tsurumi, all of Mito, Japan, assignors to Nippon Telegraph and Telephone Public Corporation, Tokyo, Japan

Division of Ser. No. 47,104, Jun. 11, 1979, Pat. No. 4,279,649. This application Apr. 10, 1981, Ser. No. 252,898

Int. Cl.³ C22C 5/00

U.S. Cl. 148—2 19 Claims



1. A method of producing an electrical contact material comprising a silver eutectic alloy comprising Ag as the main component in which fine oxide particles are uniformly dispersed, said method comprising the steps of:

(a) admixing with Ag at least one element selected from the group consisting of Si and Ge;

(b) melting said admixture of Ag and said at least one element to form an alloy;

(c) quenching said alloy;

(d) annealing said quenched alloy in a vacuum;

(e) plastically working said annealed alloy; and

(f) internally oxidizing said plastically worked alloy.

4,330,332

PROCESS FOR THE PREPARATION OF MOLYBDENUM-TUNGSTEN CARBIDES

Herbert Schachner, Grand-Lancy, Switzerland; Carl S. G. Ekemar, Saltsjo-Boo, and Bengt O. Haglund, Huddinge, both of Sweden, assignors to Battelle Memorial Institute, Carouge/-Geneva, Switzerland

PCT No. PCT/EP78/00004, § 371 Date Apr. 9, 1979, § 102(e) Date Apr. 5, 1979, PCT Pub. No. WO79/00089, PCT Pub. Date Feb. 22, 1979

PCT Filed Jul. 27, 1978, Ser. No. 114,088

Claims priority, application Switzerland, Aug. 9, 1977, 9725/77

Int. Cl.³ B22F 1/00; C04B 35/52; C22C 29/00

U.S. Cl. 75—203 3 Claims

1. A process for the preparation of an extrahard material based on a metal carbide of hexagonal crystal structure identical with that of tungsten carbide and of formula $Mo_xW_{1-x}C$ wherein $0.01 < x < 1$ which consists essentially of the following steps:

(a) intimately contacting on a molecular level a compound having the formula $(Mo_xW_{1-x})_2C$ where the total amount of Ni, Co and Fe therein does not exceed 0.1% with an amount of carbon or a carbon-containing gas at least equal to the stoichiometric amount required to form the metal carbide of hexagonal crystal structure identical with that of tungsten carbide; and

(b) heating said compound of the formula $(Mo_xW_{1-x})_2C$ in intimate contact with said carbon or said carbon-containing gas to a temperature between 1000° C. and a temperature T_x lower than the maximum temperature limit of the domain of stability of the $Mo_xW_{1-x}C$ phase, T_x being equal to 2700° C.–1375x° C. in the case where $0.01 < x \leqq 0.8$ and equal to 3400° C.–2250x° C. in the case where $0.8 \leqq x < 1$.

4,330,333

HIGH TITANIUM NITRIDE CUTTING MATERIAL

Norman R. Gibbs, Birmingham, Mich., assignor to The Valeron Corporation, Madison Heights, Mich.

Filed Aug. 29, 1980, Ser. No. 182,383

Int. Cl.³ B22F 3/12, 7/06

U.S. Cl. 75—244 1 Claim

1. A powder metallurgical sintered cutting tool insert consisting essentially of:

from about 15 to about 25 percent by weight of a nickel cobalt alloy, the ratio of nickel to cobalt being between about 0.8 and about 1.2;

from about 3 to about 6 percent by weight of a molybdenum carbide;

from about 2 to about 5 percent by weight of vanadium carbide;

from about 15 to about 25 percent by weight of titanium carbide;

from about 30 to about 40 percent by weight of titanium nitride; and

from about 15 to about 20 percent by weight of tungsten carbide.

4,330,334

MODIFYING MORTARS OF INORGANIC BINDING AGENTS WITH ALKYLATED SULPHONATED PHENOL-FORMALDEHYDE CONDENSATION PRODUCT

Kurt Schaupp; Gunther Reitz, both of Cologne, and Günther Boehmke, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Aug. 6, 1980, Ser. No. 175,802

Claims priority, application Fed. Rep. of Germany, Sep. 4, 1979, 2935719

Int. Cl.³ C04B 7/35

U.S. Cl. 106—90 17 Claims

1. In a mortar comprising an inorganic binder, water and a sulphonated phenol condensation product modifier therefor, the improvement wherein said condensation product comprises a formaldehyde condensation product of a phenol wherein at least about 40% of the phenolic OH groups are etherified with an alkylating agent, the condensation product being present in about 0.05 to 5% by weight of the binder.

4,330,335

NONFLAMMABLE BUILDING MATERIAL AND PROCESS FOR PREPARING SAME

Yasutoshi Kato, and Nobuo Inui, both of Osaka, Japan, assignors to Kubota, Ltd., Osaka, Japan

Continuation of Ser. No. 127,842, Mar. 6, 1980, abandoned. This application Feb. 23, 1981, Ser. No. 236,651

Claims priority, application Japan, Oct. 23, 1979, 54/137377

Int. Cl.³ C04B 7/02

U.S. Cl. 106—99 10 Claims

1. A process for preparing a nonflammable building material

from aggregate and cement containing lime characterized by the steps of:

mixing together 20 to 60% by weight of a finely divided aggregate which wholly passes through a 4-mesh screen and contains not more than 5% of particles of minus 200 mesh size, 1.0 to 7.0% by weight of a pulp prepared from a fibrous cellular material, 0.05 to 2.0% by weight of an organic fiber and the balance cement and siliceous sand in a CaO to SiO_2 mole ratio of 0.5–1.0 to prepare a starting material,

spreading the starting material on a travelling belt conveyor in the form of a layer of uniform thickness,

applying water to the upper surface of the layer to cause the water to penetrate into the layer,

compressing the wet layer with a roller for shaping,

cutting the compressed and shaped layer to a specified size, and

removing the cut layer from the belt conveyor and curing the layer with steam after or without spontaneously curing the layer.

4,330,336

METHOD OF PRODUCING LOW-LINE ALUMINOUS CEMENT FROM ALUMINUM SMELTING RESIDUE

Keiichi Akiyama, Tokyo, Japan, assignor to Japan Aluminium Alloy Refiners Association, Tokyo, Japan

Filed Aug. 5, 1981, Ser. No. 290,129

Int. Cl.³ C04B *7/32*

U.S. Cl. 106—104 **9 Claims**

1. A method of producing a low-lime aluminous cement from an aluminum smelting residue, which comprises mixing an aluminum smelting residue with a starting calcareous material and smelting or semi-smelting the mixture, wherein the starting calcareous material is added in such an amount, relatively to SiO_2, Al_2O_3 and MgO contained in the aluminum smelting residue, that the smelted or semi-smelted mixture of the aluminum smelting residue and starting calcareous material has a composition of 2CaO. $Al_2O_3.SiO_2$, $MgO.Al_2O_3$ and $CaO.nAl_2O_3$ and the CaO content in said mixture is 20 to 30% by weight, the smelted or semi-smelted product formed by smelting or semi-smelting the mixture is pulverized by strongly blowing air to the smelted or semi-smelted mixture to oxidize AlN, and the pulverized product is then finely divided.

4,330,337

GLASS FIBERS WITH IMPROVED DISPERSIBILITY IN AQUEOUS SOLUTIONS AND SIZING COMPOSITION AND PROCESS FOR MAKING SAME

Roy R. Graham, Lexington, N.C., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Mar. 19, 1980, Ser. No. 131,580

Int. Cl.³ C08K *5/17*; C08L *3/02, 29/04, 89/00*

U.S. Cl. 106—135 **15 Claims**

1. An aqueous treating formulation for glass fibers to improve the dispersibility of glass fibers in aqueous solution, comprising:

(a) phosphate esters of polyoxyethylene alkyl alcohol in an amount of at least about 45 percent by weight of the nonaqueous constituents,

(b) polyamine compound having at least three active amine hydrogens per molecule in an amount in the range of about 5 to about 45 weight percent of the nonaqueous constituents,

(c) a small amount of carboxylic acid, and

(d) water in an amount sufficient to solubilize the alcohol, polyamine, and carboxylic acid.

9. An aqueous sizing composition for glass fibers to produce glass fibers with improved dispersibility in aqueous solution, comprising:

(a) 0.1 to 1.5 percent of the aqueous composition of an amount of a mixture comprising:

i at least about 45 weight percent of the mixture of phosphate esters of polyoxyethylene alkyl alcohol,

ii about 5 to about 45 weight percent of the mixture of a polyamine compound having at least three active amine hydrogens per molecule,

iii about 1 to about 20 weight percent of the mixture of an organic acid,

(b) about 1 to about 10 weight percent of the aqueous sizing composition of a film-former selected from the group consisting of starch, polyvinyl alcohol or gelatin, and

(c) about 9 to about 99 weight percent water.

4,330,338

PHARMACEUTICAL COATING COMPOSITION, AND PREPARATION AND DOSAGES SO COATED

Gilbert S. Banker, Lafayette, Ind., assignor to Purdue Research Foundation, West Lafayette, Ind.

Continuation of Ser. No. 947,948, Oct. 2, 1978, abandoned. This application May 23, 1980, Ser. No. 152,872

Int. Cl.³ C08L *1/28, 1/14, 39/06, 31/04*

U.S. Cl. 106—197 C **6 Claims**

1. A coating composition for pharmaceutical dosages comprising:

a bacteria growth resistant aqueous dispersion of submicron average sized spherical particles formed of at least one water insoluble polymer selected the group consisting of ethyl cellulose, polyvinyl acetate phthalate, cellulose acetate phthalate, and hydroxy propyl methyl cellulose phthalate;

at least one annealing agent in the form of a water soluble polymer;

at least one plasticizer selected from the group consisting of propylene glycol, glycerin, glyceryl triacetate and polyethylene glycol;

an emulsifying agent; and

an emulsion stabilizer selected from the group consisting of cetyl alcohol and n-decane;

the solids contents of the aqueous dispersion being at least 40 percent by weight.

2. A coating composition as set forth in claim 1 in which the water soluble polymer constituting the annealing agent is selected from the group consisting of hydroxypropyl cellulose, hydroxypropyl methylcellulose, methyl cellulose, methyl ethyl cellulose, polyvinylpyrrolidone and sodium carboxymethylcellulose.

4,330,339

LOWER ALKANOIC ACID DERIVATIVES OF A DIETHANOLAMINE/FATTY ACID CONDENSATE

Kenneth H. Nimerick, Tulsa, Okla., assignor to The Dow Chemical Company, Midland, Mich.

Filed Jan. 4, 1980, Ser. No. 109,723

Int. Cl.³ C08L *91/00*

U.S. Cl. 106—243 **8 Claims**

1. A composition of matter comprising the reaction product of two components:

(1) a condensation product of diethanolamine and a C_{10}–C_{24} fatty acid condensed in a mole ratio of about 1:2, and

(2) about one-half the equimolar amount of a C_1–C_4 monocarboxylic acid or mixture thereof, based on the moles of condensate.

4,330,340

PROCESS TO RECYCLE BITUMINOUS ROOFING REFUSE INTO SOLID FUEL AND OTHER ENERGY-RELATED PRODUCTS

Wayne H. Carlton, P. O. Box 1000, Englewood, Colo. 80110

Continuation-in-part of Ser. No. 878,951, Mar. 7, 1978, abandoned. This application Apr. 29, 1980, Ser. No. 145,314

Int. Cl.³ C08L *95/00*

U.S. Cl. 106—281 R **1 Claim**

1. The new recycling process designed to separate and re-

cover four reusable products from bituminous roofing refuse, comprising:

(a) sizing the feed into approximately 12" squares,
(b) heating the materials to a temperature of 500 degrees F.,
(c) skimming-off the floating bitumen saturated fibrous paper pulp,
(d) adding a high-grade coal-dust particulate to the hot pulp mix in (c) above, thoroughly mixing the two prior to compaction,
(3) pumping-off the excess hot liquefied bitumen, and
(f) mechanically recovering and separating the bitumen coated aggreagates, and
(g) mechanically recovering and hand-separating the disimilar metal scraps, and
(h) packaging separately each of the above four products separated in c+d, e, f and g, above.

4,330,341

HIGHLY CONCENTRATED FILLER SLURRIES

Adolf May, Hofheim am Taunus, and Franz J. Voetz, Camberg, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

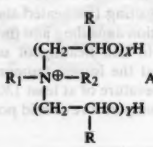
Filed Feb. 2, 1981, Ser. No. 230,319

Claims priority, application Fed. Rep. of Germany, Feb. 8, 1980, 3004611

Int. Cl.³ C09C *3/08*

U.S. Cl. 106—308 N **7 Claims**

1. Filler slurries with a content of 0.1 to 5% by weight of a compound of the formula



(1)

in which R is hydrogen or methyl, R_1 is C_8–C_{24}-alkyl, C_8–C_{24}-alkenyl, or C_8–C_{24}-alkylphenyl, R_2 is hydrogen, C_1–C_4-alkyl, C_1–C_4-hydroxyalkyl, C_2–C_4-epoxyalkyl, benzyl or a group of the formula

X, Y and Z together are a number from 1 to 20, and A means an anion.

4,330,342

PROCESS FOR REGENERATING SPENT PICKLE LIQUID CONTAINING ZRF_4

Wolfgang Fennemann, Karben, and Jürgen Haldorn, Oberursel, both of Fed. Rep. of Germany, assignors to Metallgesellschaft Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

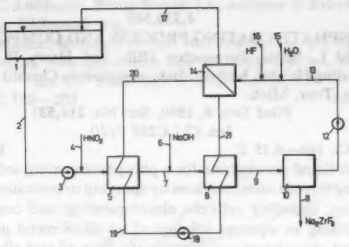
Filed Feb. 26, 1981, Ser. No. 238,329

Claims priority, application Fed. Rep. of Germany, Mar. 11, 1980, 3009265

Int. Cl.³ C23G *1/36*

U.S. Cl. 134—13 **11 Claims**

1. A process for regenerating a spent HF-HNO_3 pickle liquid which contains ZrF_4, which comprises heating said spent pickle liquid to above 40° C., adding an aqueous solution containing dissolved NaOH to said so-heated pickle liquid in an amount sufficient to form Na_2ZrF_6, thereafter cooling said so-treated pickle liquid to a temperature below 20° C. whereby



to precipitate said Na_2ZrF_6 and removing said Na_2ZrF_6 from said so-cooled pickle liquid whereby to regenerate the same.

4,330,343

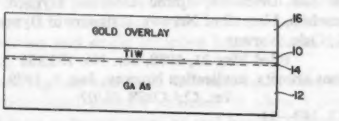
REFRACTORY PASSIVATED ION-IMPLANTED GAAS OHMIC CONTACTS

Aristos Christou, Springfield, and John E. Davey, Alexandria, both of Va., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Continuation-in-part of Ser. No. 1,031, Jan. 4, 1979, Pat. No. 4,263,605. This application Dec. 10, 1980, Ser. No. 214,926

Int. Cl.³ H01L *7/54, 7/36, 23/48*

U.S. Cl. 148—1.5 **11 Claims**



1. A method for forming an improved ohmic contact for semiconductors comprising the steps of:

depositing a layer of refractory material on a N-type GaAs base material to form a refractory mask;

implanting ions through the refractory mask to establish an n^+ region in the GaAs base material with a peak concentration within about 100 Å of the refractory mask-GaAs interface.

annealing the implanted structure to activate the implanted ions; and

depositing a gold overlay on the refractory mask.

4,330,344

SELECTIVE ABSORBER OF SOLAR ENERGY AND PROCESS FOR PRODUCING SAME

Shiro Terai; Toshio Amitani; Toshio Suzuki; Katsuhiko Hirata, and Makoto Andoh, all of Nagoya, Japan, assignors to Sumitomo Light Metal Industries, Ltd., Tokyo, Japan

Filed Dec. 29, 1980, Ser. No. 221,060

Int. Cl.³ C23F *7/26, 7/06*

U.S. Cl. 148—6.2 **17 Claims**

1. A process for producing a selective absorber of solar energy, which comprises the steps of

subjecting a smooth-surfaced substrate of an aluminum alloy material, containing at least about 0.1% by weight of magnesium and having a specular reflectance of at least 50% at an incident angle of 60°, to a chemical conversion treatment in an aqueous solution containing chromate and/or dichromate to form a chromium-containing chemical conversion coating on a surface of said substrate, and

subsequently subjecting the substrate to an oxidation treatment at a temperature of 400°–600° C. and for a time sufficient to convert said chemical conversion coating into

an oxidized, dark-colored coating having high solar absorptance and low thermal emissivity.

4,330,345

PHOSPHATE COATING PROCESS AND COMPOSITION

Donald L. Miles, Farmington Hills, and Harry R. Charles, Sterling Heights, both of Mich., assignors to Chemfil Corporation, Troy, Mich.

Filed Dec. 8, 1980, Ser. No. 214,537
Int. Cl.³ C23F 7/10
U.S. Cl. 148—6.15 Z 10 Claims

1. A liquid concentrate for a phosphate coating solution for coating ferrous metal surfaces by spraying or emersion prior to painting, including cathodic electropainting, said concentrate comprising an aqueous solution of an alkali metal phosphate salt and zinc phosphate, wherein the ratio of said alkali metal phosphate salt to said zinc phosphate in the concentrate is from one-half to two moles of said alkali metal phosphate salt to one mole of said zinc phosphate, said concentrate supressing the zinc concentration in the phosphate coating solution to 0.1 to one gram per liter and producing a phosphate coating on metal surfaces treated by said phosphate coating solution enriched in zinc-iron-phosphate phosphophyllite compared to zinc phosphate hopeite, said phosphate coating having a generally horizontally oriented fine crystalline structure which is resistant to physical abuse and corrosion.

4,330,346

CAP-SENSITIVE POWDERED EXPLOSIVE COMPOSITION

Oddvar Alm, Drammen; Bjarne Andersen, Hyggen, and Eirik Samuelsen, Lier, all of Norway, assignors to Dyno Industrier A.S., Oslo, Norway

Filed May 21, 1980, Ser. No. 152,152
Claims priority, application Norway, Jun. 1, 1979, 791830
Int. Cl.³ C06B 45/02
U.S. Cl. 149—21 6 Claims

1. A cap-sensitive powdered explosive composition having no explosive components and having ammonium nitrate as its single oxygen releasing component, characterized in that said explosive composition, in addition to ammonium nitrate and further optional components useful in explosive compositions, contains all of the following four components in amounts within the respective ranges, in percent by weight of the explosive composition:

(a) 3 to 8% of a combustible liquid consisting of one or more completely water soluble components, having a boiling temperature of above 120° C., and being capable of dissolving ammonium nitrate in amounts of between 20 grams and 100 grams per 100 grams of said liquid without reacting chemically with ammonium nitrate;

(b) 0.5 to 2.5% of a water blocking agent consisting of a high molecular weight polysaccharide having the property of imparting high viscosity to an aqueous, saturated ammonium nitrate solution;

(c) 0.5 to 3% of a water-insoluble wax or waxy substance in finely pulverized form;

(d) 1 to 6% of an aluminium powder the particles of which are in flake form and which have a specific surface of at least 5000 cm^2 per gram.

4,330,347

RESISTIVE COATING FOR CURRENT CONDUCTORS IN CRYOGENIC APPLICATIONS

Chikara Hirayama, and George R. Wagner, both of Murrysville, Pa., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jan. 28, 1980, Ser. No. 115,866
Int. Cl.³ B32B 33/00
U.S. Cl. 148—31.5 3 Claims

1. A superconducting article comprising:

a matrix core containing a superconductor;

a copper-containing cladding disposed about said core; and

an adherent coating of copper sulfide formed on the outer surface of said cladding which is electrically insulating at cryogenic temperatures.

4,330,348

METHOD FOR HEATING CONTINUOUSLY CAST STEEL SLAB FOR PRODUCTION OF GRAIN-ORIENTED SILICON STEEL SHEET HAVING HIGH MAGNETIC FLUX DENSITY

Takashi Nagano, Kitakyusyushi, Japan, assignor to Nippon Steel Corporation, Tokyo, Japan

Filed Dec. 5, 1980, Ser. No. 213,731
Claims priority, application Japan, Dec. 13, 1979, 54-161916
Int. Cl.³ H01F 1/04
U.S. Cl. 148—111 6 Claims

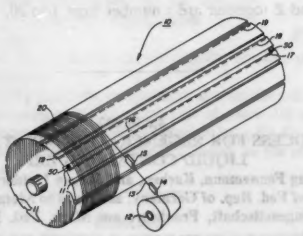
6. In a method for producing a grain-oriented silicon steel sheet having high magnetic flux density, comprising heating a continuously cast steel slab containing not more than 0.085% C, 2.0 to 4.0% Si, not more than 0.15% Mn and 0.010 to 0.065% sol. Al, and subjecting the heated slab to hot rolling, cold rolling, decarburization annealing and finishing annealing, the improvement wherein said heating of said continuously cast steel slab is such that the lowest temperature portion of said slab is held at a temperature of at least 1300° C. for at least 30 minutes and the final temperature of said portion of said slab is at least 1330° C.

4,330,349

METHOD FOR PREPARING CONDUCTIVE FIBER BRUSHES

Joseph A. Swift, Ontario; C. Michael Ray, Fairport, and Joan R. Ewing, Pittsford, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Oct. 2, 1980, Ser. No. 193,241
Int. Cl.³ A46D 1/00
U.S. Cl. 156—72 15 Claims



1. A method for making conductive brushes which comprises providing a rotatable cylindrical mandrel having at least one longitudinal recess on its surface, positioning a first strip of a backing material in said recess, winding electrically conductive fibers from a supply around said mandrel by rotating the mandrel, fastening said conductive fiber windings to each other by adhesive means on the windings at the recess, positioning a second strip of a backing material on said conductive

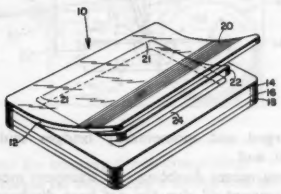
fiber windings opposite said recess, fastening said two strips together, and cutting the conductive fiber windings in the longitudinal direction of the mandrel to obtain conductive brushes of appropriate fiber length.

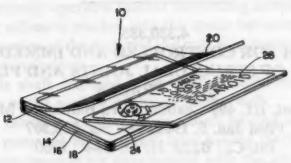
4,330,350

PREENCODABLE ID CARDS

Paul A. Andrews, Belmont, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Mar. 3, 1981, Ser. No. 240,083
Int. Cl.[3] B32B *31/00;* G09F *3/02;* B44C *1/26;* B32B *3/10*
U.S. Cl. 156—152 11 Claims





1. An ID card structure comprising an envelope having front and back protective sheet components sandwiching a frame member having a well opening suitable to accommodate an information-bearing document therein, at least one of said front and back sheet components having a magnetic encoding capability provided by a layer of magnetic material in the form of a stripe extending over a predetermined area of the outermost surface of the sheet component, and including a removable interleaf member positioned within said well opening of the frame member, the dimensions of the interleaf member being substantially the same as the dimensions of the well opening so that when the interleaf is in position within the well opening of the frame and both front and back sheet components are superposed in sandwiching disposition thereto, substantially all portions of the magnetic stripe material are supported by a substantially flat surface provided by the frame and interleaf member, so that the magnetic stripe material may be encoded prior to insertion and sealing of an information-bearing document within the ID card structure.

10. A method of preparing a magnetically encoded ID card comprising:

encoding a magnetic stripe element extending across a predetermined area of the outermost surface of a protective sheet component of an ID card structure;

removing an interleaf member positioned within a well opening of an interior frame member of the ID card structure;

inserting an information-bearing document into said well opening; and

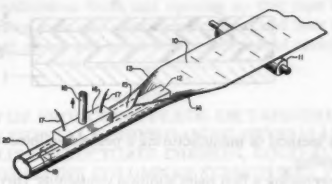
sealing said document encased within said well opening and sandwiched between two protective sheet members.

4,330,351

METHOD AND APPARATUS FOR MAKING COLLAPSIBLE DISPENSING TUBES

Lewis C. LoMaglio, Baton Rouge, La., assignor to Ethyl Corporation, Richmond, Va.

Continuation-in-part of Ser. No. 34,400, Apr. 30, 1979, abandoned. This application Jan. 12, 1981, Ser. No. 223,988
Int. Cl.[3] B29D *23/10;* B32B *1/08, 1/10*
U.S. Cl. 156—203 10 Claims



1. A method for fusing an overlapped area of a tube formed from a heat fusible laminated sheet containing a lamina of metal and a thermoplastic lamina, said method comprising:

a. advancing said tube over stationary, rigid steel mandrel means;

b. holding said tube over said mandrel means in a stationary position;

c. force a single induction heating means against the outside of said overlapped area of the tube to heat the tube and to apply pressure of from about 500 to about 1200 pounds per square inch to said area to fuse said area to form a seam;

d. removing said single induction heating means from said seam; and,

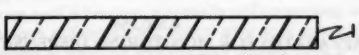
e. advancing said tube with said heat fused seam therein a predetermined distance sufficient to allow a portion of said seam to be contacted by said heating means.

4,330,352

METHOD OF FORMING A METALLIZED DECORATIVE FILM LAMINATE

Whiteford Grimes, Weston, Conn., and Ronald A. Lombardi, New Windsor, N.Y., assignors to Stauffer Chemical Company, Westport, Conn.

Division of Ser. No. 36,953, May 7, 1979, which is a continuation of Ser. No. 826,219, Aug. 19, 1977, abandoned. This application Apr. 7, 1980, Ser. No. 137,654
Int. Cl.[3] B41M *3/12;* B44C *1/16*
U.S. Cl. 156—235 3 Claims



1. A method of forming a decorative film laminate which comprises a substantially transparent plastic film, a thin continuous metallic layer adhesively attached to one side of the plastic film, and a layer of pressure sensitive adhesive attached to the thin continuous metallic layer on the side of said metallic layer that is remote from the side attached to the plastic film, said method comprising:

(a) adhesively attaching a metallized transfer laminate to one side of the substantially transparent plastic film, said transfer laminate having the thin continuous metallic layer attached to a carrier film;

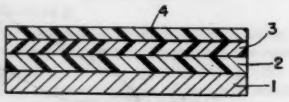
(b) stripping the carrier film from the product resulting from Step (a); and

(c) attaching a layer of pressure sensitive adhesive to the side of the metallic layer which is remote from the side attached to the substantially transparent film.

4,330,353
METHOD TO IMPROVE WETTING OF PEELABLE ADHESIVE STRUCTURES

Go Kunimoto, and Fumio Mori, both of Yokohama, Japan, assignors to Toyo Seikan Kaisha, Ltd., Tokyo, Japan

Division of Ser. No. 50,864, Jun. 22, 1979, Pat. No. 4,270,665.
This application Feb. 20, 1981, Ser. No. 236,535
Int. Cl.[3] C09J *5/04;* B65D *41/12;* B32B *15/08*
U.S. Cl. 156—314 1 Claim



1. A method of manufacturing a peelable adhesive structure comprising:

(a) preparing a first paint solution containing vinyl resin and a hydrocarbon or natural resin having a softening point less than 180° C. and having a concentration between about 50 and 200 parts by weight per 100 parts by weight of vinyl resin wherein the hydrocarbon or natural resin is stably emulsified and dispersed in a continuous phase of the vinyl resin;

(b) applying the first paint solution onto a metal base material to form a first coating layer having a thickness ranging from about 0.5 to about 100 mg/m^2;

(c) forming a second coating layer by applying a second paint solution containing epoxy resin and polyethylene oxide at a concentration of between about 0.5 and 90 weight percent of the epoxy resin over the first coating layer, said second coating layer having a thickness ranging from about 0.5 to about 100 mg/m^2; and

(d) joining a layer of olefin resin to the second coating layer by melt adhesion or heat sealing; said method further characterized in that at least one of the coating layers comprises:

(i) a peeling imparter at a concentration of between about 50 and 200 parts by weight per 100 parts by weight of resin, and

(ii) a substantially linear saturated polyester wetting improver at a concentration of between about 2 and 50 parts by weight per 100 parts by weight of resin and having a molecular weight of between about 5,000 and about 50,000,

whereby the peelable adhesive structure has a peeling strength between about 0.05 and 5 kg/cm between the first and the second coating layers.

4,330,354
APPARATUS FOR MONITORING DISPENSATION OF GLUE IN AN AUTOMATIC GLUEING MACHINE

Joachim Deubner, Oberasbach, and Franz Zeh, Nuremberg, both of Fed. Rep. of Germany, assignors to Triumph-Werke Nurnberg A.G., Nuremberg, Fed. Rep. of Germany

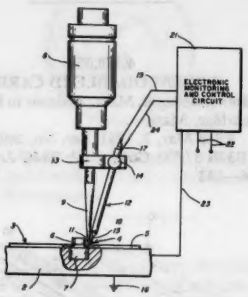
Filed Apr. 3, 1980, Ser. No. 136,873
Claims priority, application Fed. Rep. of Germany, Apr. 12, 1979, 2915006
Int. Cl.[3] B32B *31/00*
U.S. Cl. 156—352 1 Claim

1. In combination with apparatus for applying measured amounts of glue for joining workpieces at a grounded workstation, including transport means for serially moving workpieces to be joined to said workstation,

a glue dispenser positioned at said workstation having a discharge opening positioned above workpieces at said workstation to be joined,

a conductive probe positioned adjacent said discharge opening of said glue dispenser and above workpieces at said workstation so as to be momentarily connected to ground by each measured amount of glue discharged, and

circuit means connected between said probe and ground, said circuit means generating a pulse for enabling said transport means when a measured amount of glue has been



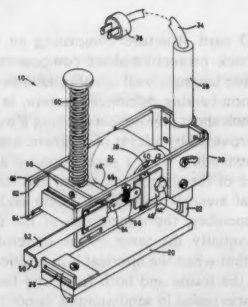
discharged and momentarily bridges said probe and ground, and

said circuit means disabling said transport means if a measured amount of glue has not been discharged within a predetermined time.

4,330,355
SYSTEM FOR CONTROLLED AND IMMEDIATE SEALING OF STRUCTURAL JOINTS AND PLASTER LINE CRACKS

John H. Bopst, III, 409 Chalfonte Dr., Baltimore, Md. 21228

Filed Jan. 5, 1981, Ser. No. 222,387
Int. Cl.[3] B32B *31/18;* B44C *7/00*
U.S. Cl. 156—361 15 Claims



2. In a system for sealing narrow openings such as joints between panel structures, cracks and the like, in drywall, plaster and the like building walls and ceilings and having: a soleplate with heat means and a guide for deploying tape along a tape laying path on a first said panel structure while being heated by the soleplate, a handle on the soleplate, and storage means on the system for a supply of tape, the improvement comprising in combination: means for assuring cutting of tape to proper length to abut a second said panel structure upright with respect to the first said panel structure, when approached in said tape laying path, including means on the system for sensing said approach, the means for assuring including means on the system for automatically stopping said system at a proper position in said approach for said tape cutting comprising means for stopping the tape supply and causing tape deployed on said surface to draw the system to a halt, the tape

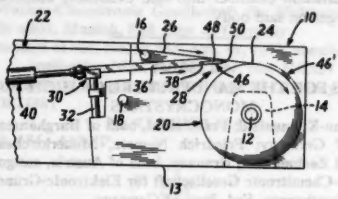
storage means comprising a spool, the automatic stopping means including means for automatically locking the spool and causing tape deployed on said surface to draw the spool, and therefore said system, to a halt.

4,330,356

WEB MARKING APPARATUS AND METHOD

Everett C. Grollimund, Midlothian, and Steven F. Spiers, Richmond, both of Va., assignors to Philip Morris, Incorporated, New York, N.Y.

Filed Jun. 18, 1980, Ser. No. 160,581
Int. Cl.³ B65H 81/00
U.S. Cl. 156—446 4 Claims



1. Apparatus for marking a web comprising:

(a) takeup means for supporting a takeup coil and rotating it on a fixed axis to draw a web longitudinally onto the coil along a predetermined path; and

(b) selectively operable marker dispensing means for feeding a flat adhesive marker into the space between the incoming portion of the web and the coil, said marker dispensing means including:

a rotable shaft disposed at an oblique angle relative to the plane of the surface of the incoming web;

a cross member secured to said shaft having a plurality of tines mounted thereto, said tines having marker engaging surfaces thereon for engagement with the adhesive side of the marker; and,

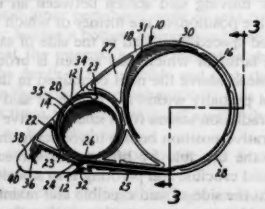
means for rotating said shaft from a position whereat said marker engaging surfaces are alongside the web for securing a marker to said tines, to a position whereat said marker engages the surface of the web for placement of the marker on the web, the oblique placement of said shaft causing said tines to move in a bi-directional path relative to the surface of the web such that as the marker approaches the web, it is moving toward the web and in the same direction as web movement.

4,330,357

DISPENSER FOR LINER-WOUND TAPE

Philip W. Collins, Cottage Grove, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Oct. 23, 1980, Ser. No. 199,742
Int. Cl.³ B32B 35/00
U.S. Cl. 156—584 2 Claims



1. A hand-held dispenser by which lengths of pressure-sensitive adhesive coated tape may be withdrawn from a supply roll of said tape convolutely wound with a release liner between its coils, said dispenser comprising walls defining:

a first cavity adapted for storing said supply roll;

a second cavity adapted for storing said liner, said second cavity being partially defined by an inner wall surface adapted to direct liner pushed into said second cavity to wind into a coil;

a tape outlet opening; and

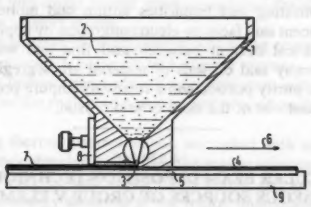
path means for connecting said first cavity and said outlet opening adapted to guide tape being withdrawn from said dispenser through said opening, for connecting said cavities to guide said liner from said first cavity into said second cavity, and for separating said liner from tape being withdrawn from said opening so that tape being withdrawn from said opening will propel said liner along said path means and into a coil in said second cavity.

4,330,358

METHOD OF PRODUCING PLATE- OR TAPE-SHAPED SILICON CRYSTAL BODIES HAVING CRYSTALLINE PILLAR-LIKE STRUCTURES THEREIN, EQUIVALENT TO CRYSTALLINE COLUMNAR STRUCTURES, FOR LARGE SURFACE SOLAR CELLS

Christa Grabmaier, Berg; Franz Otto, and Helmut Thomann, both of Munich, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Jun. 17, 1980, Ser. No. 160,214
Claims priority, application Fed. Rep. of Germany, Jul. 4, 1979, 2927086
Int. Cl.³ H01L 31/18; C03B 1/02
U.S. Cl. 156—603 22 Claims



1. A method of producing plate- or tape-shaped silicon crystal bodies having a crystalline pillar structure therein, which is substantially equivalent to crystalline columnar structures, without melting of the base material which forms such silicon bodies and which bodies are useful are processing into large-surface solar cells, comprising:

forming a slurry from an admixture of a silicon powder comprised of silicon particles having an average grain size in a range of less than about 1 μm and a liquid binder;

extruding a relatively thin layer of said slurry and drying said layer until it becomes essentially self-supporting; and

sintering such self-supporting slurry layer in a protective atmosphere at sintering temperatures ranging from about 1350° C. to below about 1430° C. in such a manner that a layer of crystalline silicon particles are generated having an average diameter substantially corresponding to the thickness of said dried slurry layer.

4,330,359

ELECTROMIGRATION PROCESS FOR THE PURIFICATION OF MOLTEN SILICON DURING CRYSTAL GROWTH

Alan M. Lovelace, Administrator of the National Aeronautics and Space Administration, with respect to an invention of, and Paul J. Shlichta, San Pedro, Calif.

Filed Feb. 10, 1981, Ser. No. 233,269
Int. Cl.³ C30B 15/34
U.S. Cl. 156—608 11 Claims

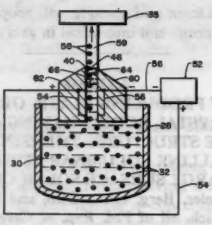
1. A process for producing high purity crystals of a material

from a molten melt of said material having impurities dispersed therein comprising the steps of:

heating said material to a temperature sufficient to form a molten melt, said melt having a crystallization zone with a crystal growth interface where said molten material is crystallized to form said crystals;

crystallizing said molten material at said crystal growth interface to form said crystals;

pulling said crystal outwardly from said crystal interface through a die at a rate sufficient to form a continuously extending crystal ribbon; and said die body having a passageway passing transversely therethrough, said body having first and second interior faces defining the sides of said passageway and said passageway further having a bottom for receiving said molten material and a top where said molten material crystallizes and exits said die body as said ribbon;



concentrating said impurities within said molten material adjacent said faces by electromigration by applying direct electrical current between said first and second faces whereby said crystals of material are segregated into a high purity portion and a relatively impure portion along at least one of the sides of said crystal.

4,330,360

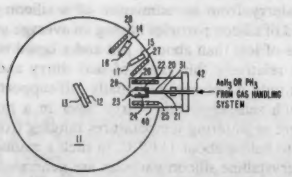
MOLECULAR BEAM DEPOSITION TECHNIQUE USING GASEOUS SOURCES OF GROUP V ELEMENTS

Glenn D. Kubiak, Palo Alto, Calif., and Morton B. Panish, Springfield, N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Jul. 21, 1980, Ser. No. 170,548

Int. Cl.³ C30B *23/06*

U.S. Cl. 156—610 **9 Claims**



1. A method for forming a group III–V semiconductor layer by molecular beam deposition including the steps of:

directing a molecular beam, comprising at least one group III element, at a semiconductor body within an evacuable chamber; and

simultaneously direction a group V molecular beam at said semiconductor body, thereby forming said group III–V semiconductor layer;

said group V molecular beam being formed by a process including the steps of:

introducing MH_3 gas, where M is at least one group V element, into a relatively high pressure chamber;

decomposing said MH_3 gas in said high pressure chamber, thereby forming intermediate molecules having a plurality of M atoms;

transporting said intermediate molecules resulting from said decomposition of MH_3 from said high pressure chamber into a relatively low pressure effusion chamber containing at least one baffle therein, said low pressure chamber being coupled to said high pressure chamber and to said evacuable chamber; and

heating said intermediate molecules in said low pressure chamber and simultaneously causing molecules in said low pressure chamber to interact with said baffle so as to further transform said intermediate molecules into M_2 molecules and to form a group V molecular beam comprising M_2 molecules which emanates from said low pressure effusion chamber into said evacuable chamber and impinges on said body.

4,330,361

PROCESS FOR THE MANUFACTURE OF HIGH-PURITY MONOCRYSTALS

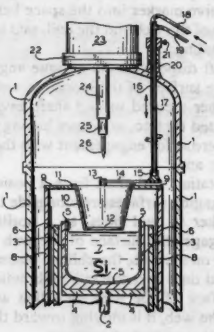
Franz Kuhn-Kuhnenfeld; Franz Köhl, both of Burghausen, Fed. Rep. of Germany; Friedrich Nemetz, Mauerkirchen, and Gerhard Zechmeister, Braunau, both of Austria, assignors to Wacker-Chemitronic Gesellschaft für Elektronic-Grundstoffe mbH, Burghausen, Fed. Rep. of Germany

Filed Feb. 6, 1981, Ser. No. 232,277

Claims priority, application Fed. Rep. of Germany, Feb. 14, 1980, 3005492

Int. Cl.³ C30B *15/20*

U.S. Cl. 156—617 SP **3 Claims**



1. In a process for the manufacture of high-purity monocrystals by the Czochralski crucible-pulling technique wherein a crystalline rod is pulled from a melt contained in a crucible at least partially covered by a radiation screen having a central opening formed therethrough for passage of the crystalline rod being pulled, the improvement comprising the steps of:

joining said radiation screen to a lifting, lowering and pivoting mechanism operable throughout the entire pulling process for moving said screen between an inoperative and operative position, in the former of which said screen is positioned spaced from and to the side of said crucible and in the latter of which said screen is brought into a position spaced above the melt contained in the crucible, and at least partially within the mouth of said crucible;

moving said radiation screen from said operative position to said inoperative position before introducing the melt material into the crucible by lifting said screen from the mouth of said crucible and pivoting it to a position spaced from and to the side of said crucible and maintaining said screen in said inoperative position during the melting of said melt material in said crucible; and

moving said radiation screen from said inoperative position to said operative position after the melt material in the crucible has been melted by pivoting said screen to a

position above said crucible and lowering it at least partially, into the mouth thereof to a position at which it is spaced above said melt with a portion thereof so positioned to shield the crystalline rod subsequently pulled through the opening thereof at least partially from the heat radiated by an exposed inner wall of the crucible.

4,330,362

DEVICE AND PROCESS FOR PULLING HIGH-PURITY SEMICONDUCTOR RODS FROM A MELT

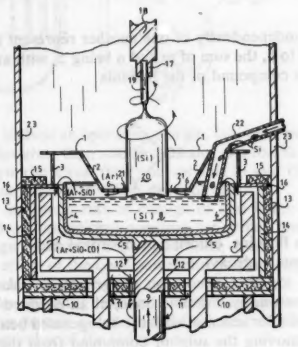
Werner Zulehner, Emmerting, Fed. Rep. of Germany, assignor to Wacker-Chemitronic Gesellschaft für Elektronik-Grundstoffe mbH, Munich, Fed. Rep. of Germany

Continuation of Ser. No. 31,553, Apr. 19, 1979, abandoned. This application Mar. 4, 1981, Ser. No. 240,537

Claims priority, application Fed. Rep. of Germany, May 17, 1978, 2821481

Int. Cl.³ C30B *15/22*

U.S. Cl. 156—617 SP 12 Claims



1. In a process for the crucible pulling of crystalline semiconductor rods according to the Czochralski technique wherein crystalline semiconductor rods are pulled from a melt in a crucible, the improvement comprising:

covering the melt, the crucible and the space laterally adjoining the side of the crucible during the prior to crucible pulling by a one-piece cover device spaced above the surface of the melt including an upper flat annular rim which is positioned above the crucible, and spaced therefrom so as to allow for the escape of gas therebetween, said rim having an outer and inner peripheral edge and being dimensioned so that said outer edge thereof projects laterally beyond the outer crucible edge and extends over the space laterally adjoining the side of said crucible, and a joining member secured to, and depending downwardly from, said inner peripheral edge of said rim, said joining member having a bottom opening and being dimensioned such that the internal height thereof is about 0.2 to 1.2 times the depth of the crucible and such that said bottom opening thereof has a cross-sectional area which is about 1.2 to 8 times the cross-sectional area of the semiconductor rod to be pulled; and

pulling a crystalline semiconductor rod from said melt in said crucible; and

during the crucible pulling directing a protective gas stream along said rod in a direction generally opposite to that in which the rod is being pulled such that is flows downwardly through said bottom opening of said joining member, over the surface of the melt, then between said cover device rim and said crucible and over the edge of the crucible.

4,330,363

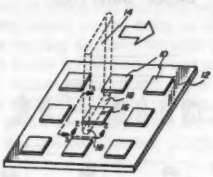
THERMAL GRADIENT CONTROL FOR ENHANCED LASER INDUCED CRYSTALLIZATION OF PREDEFINED SEMICONDUCTOR AREAS

David K. Biegesen, Woodside; Noble M. Johnson, Menlo Park; Dirk J. Bartlelink, Los Altos, and Marvin D. Moyer, Cupertino, all of Calif., assignors to Xerox Corporation, Stamford, Conn.

Filed Aug. 28, 1980, Ser. No. 182,195

Int. Cl.³ C30B *13/06*

U.S. Cl. 156—620 22 Claims



1. A method of converting predefined areas of semiconductor material into single crystal areas comprising the steps of:

providing support means,

providing an array of optical energy absorbing crystallizable semiconductor areas upon said support means,

providing optical energy absorbing means upon said support means in the region adjacent to and around each of said areas,

providing thermal control means, associated with said optical energy absorbing means, in the region adjacent to and around each of said areas, for effecting the amount of thermal energy absorbed in the region immediately adjacent to and around each area to compensate for perferential heat loss at the edges of each of said areas.

projecting an optical energy source wherein said source is a shaped laser spot upon and to expose a portion of each of said areas and that portion of said optical energy absorbing means and said thermal control means immediately adjacent and around each of said areas, and imparting relative motion between said spot and said substrate, said spot being of elongated shape such that its short dimension is less than the dimension of each of said areas in the direction of relative movement and its long dimension is greater than the dimension of each of said areas normal to the direction of relative movement,

melting the exposed portion of each of said areas with said optical energy source,

elevating the temperature of the exposed portion of said optical energy absorbing means with said optical energy source,

removing said optical energy source,

cooling said optical energy absorbing means by drawing heat stored therein into said support means,

cooling said melted areas by drawing heat stored therein into said support means, and

establishing a differential thermal gradient between the central portion of each of said areas and the edges of each of said areas for slowing the rate of cooling at said edges such that as said melted areas cool, each will crystallize from a single nucleation location and competitive nucleation locations at said edges will be suppressed, whereby each of said areas will be converted to a single crystal when cooled.

4,330,364

PROCESS OF STRENGTHENING DILUTE PHOSPHORIC ACID

Walter Blumrich, Frankfurt am Main; Karl H. Dörr, Mainz; Hans J. König, Frankfurt am Main, and Ulrich Sander, Friedrichsdorf, all of Fed. Rep. of Germany, assignors to Metallgesellschaft Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

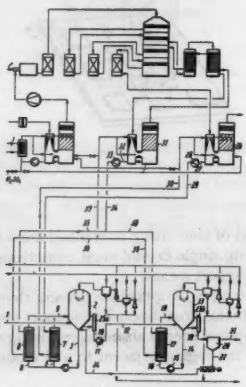
Continuation of Ser. No. 41,468, May 22, 1979, Pat. No. 4,276,116. This application Sep. 29, 1980, Ser. No. 191,584

Claims priority, application Fed. Rep. of Germany, Jun. 1, 1978, 2824010

The portion of the term of this patent subsequent to Jun. 30, 1998, has been disclaimed.

Int. Cl.³ B01D *1/00*

U.S. Cl. 159—47 R 4 Claims



1. In a process for concentrating dilute phosphoric acid in a phosphoric acid process characterized by a plurality of separate phosphoric acid cycles, wherein the phosphoric acid is concentrated in each cycle by a vacuum evaporator, the improvement wherein the phosphoric acid in the phosphoric acid cycle is heated by indirect heat exchange with liquid water under pressure which is conducted in a closed cycle and heated by indirect heat exchange with sulfuric acid within an SO_3 absorber of a sulfuric acid contact process, said sulfuric acid having a temperature of 80°–200° C.

4,330,365

PAPER CONTAINING CATIONIC STARCH GRAFT COPOLYMERS FROM STARCH, N,N'-METHYLENEBISACRYLAMIDE, AND POLYAMINES

Martin M. Tessler, Edison, N.J., assignor to National Starch and Chemical Corporation, Bridgewater, N.J.

Division of Ser. No. 138,015, Apr. 7, 1980, Pat. No. 4,278,573. This application Feb. 2, 1981, Ser. No. 230,239

Int. Cl.³ D21H *3/28*

U.S. Cl. 162—168 NA 13 Claims

1. In a method for making paper containing pigment, the step which comprises adding, as a pigment retention aid, to the stock at any stage prior to forming a web, a starch-g-poly(N,N'-methylenebisacrylamide-co-amine) copolymer—comprising a N,N'-methylenebisacrylamide-amine copolymer grafted to a starch base through said N,N'-methylenebisacrylamide,—wherein said amine is a polyamine containing at least two primary or secondary amine groups or mixtures thereof, said starch-g-copolymer being added to said stock in an amount of from about 0.05 to 2.0% by weight, based on said dry pulp.

4,330,366

PROCESS FOR THE PREPARATION OF HALOGENATED BENZOYL FLUORIDES

Albrecht Marhold, Leverkusen, and Erich Klauke, Odenthal, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

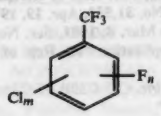
Filed Jul. 21, 1980, Ser. No. 170,448

Claims priority, application Fed. Rep. of Germany, Aug. 4, 1979, 2931688

Int. Cl.³ C07C *51/58*

U.S. Cl. 260—544 F 8 Claims

1. A process for the preparation of a halogenated benzoyl fluoride, which comprises contacting a halogenated benzotrifluoride of the formula



in which

m and n independently of one another represent an integer from 0 to 5, the sum of m and n being 5, with at least one sulphur compound of the formula

in which

X denotes fluorine, chlorine or hydroxyl and

Y represents hydroxyl, or

X and Y together denote an oxygen atom linked to the sulphur atom by a double bond, at an elevated temperature, and after reaction with the halogenated benzotrifluoride, removing the sulphur compound from the reaction mixture in the form of a compound of the formula

in which

X has the meaning given and

Hal represents fluorine or chlorine.

4,330,367

SYSTEM AND PROCESS FOR THE CONTROL OF A NUCLEAR POWER SYSTEM

Charles R. Musick, Vernon, Conn., assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed May 22, 1973, Ser. No. 362,697

Int. Cl.³ G21C *7/36*

U.S. Cl. 376—245 8 Claims

1. A protection apparatus for a nuclear power system which utilizes a quantitative relationship between a fuel cladding integrity index indicative of the proximity of the nuclear power system to a fuel cladding integrity design limit and select system parameters, said system having means for generating electrical parametric signals proportional to said select nuclear power system's parameters, said apparatus comprising:

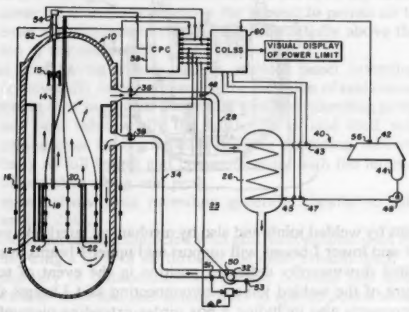
a. first means responsive to said electrical parametric signals for predicting the violation of said design limit by continuously approximating the projected value of said index and comparing the projected value of the index with said design limit;

b. second means responsive to said predicting means for

initiating protective action for the prevention of the violation of said design limit; and

c. means for generating an operating limit on a select system parameter, said limit having a value which insures that said prediction and prevention means have adequate time to predict the violation of said design limit and to institute protective action for the prevention of said design limit violation;

d. wherein said means for generating an operating limit include third means responsive to said electrical parametric signals for determining a limiting value of said index



which include an operating margin, said third means being more accurate than said first means, and fourth means for modifying in a real time one variable in said third means by a margin factor which depends on,

1. the maximum rate of change of said index associated with an operational accident for which the cladding design limit must not be exceeded; and
2. the effect of the core power distribution on protection system reaction time,

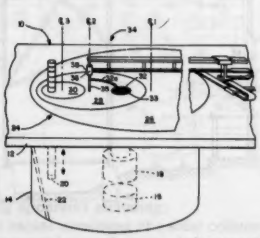
whereby the operating limit on a system parameter including an operating margin is determined from said relationship and said limiting value of the index.

4,330,368

CABLE HANDLING SYSTEM FOR USE IN A NUCLEAR REACTOR

Elmer M. Larson, Woodland Hills; Edward Moody, Simi, and Robert O. Crosgrove, Chatsworth, all of Calif., assignors to Electric Power Research Institute, Inc., Palo Alto, Calif.

Filed Feb. 21, 1979, Ser. No. 13,420
Int. Cl.³ G21C *19/20*
U.S. Cl. 376—460 **9 Claims**



1. In a nuclear reactor of the type having some operating components housed within a sealed vessel which includes an assembly of rotatably mounted, horizontal plugs serving to perform certain position related functions such as refueling within the vessel by rotating about predetermined vertical axes without opening said vessel to the ambient surroundings, said installation requiring power, instrumentation and service cable means extending between an internal location within the vessel and an external location whereby to interconnect certain ones of the components within the vessel to remote, external components, a system for providing said connections, even during rotation of said plugs during performance of said certain functions including refueling, said system comprising:

means including a vertical drum mounted above the topside of one of said plugs for rotation therewith about at least one of said axes, a first section of said power, instrumentation and service cable means extending between said certain components within said vessel and a fixed terminal point on the circumference of said drum, said first section being movable with said one rotatable plug and said drum;

a second section of said cable means extending between said fixed terminal point and a remote, external point such that the distance between said two points varies depending upon the way in which said one plug and drum rotate, said second cable means section being so configures to compensate for varying distances between said points; and

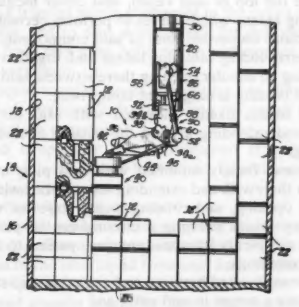
cable support means for supporting said second cable means section for movement with said drum and for causing a segment of said second section to wrap around or unwrap from said drum, depending upon the way in which the latter and said one plug rotate.

4,330,369

THERMALLY ACTUATED LINKAGE ARRANGEMENT

Paul M. Anderson, San Diego, Calif., assignor to General Atomic Company, San Diego, Calif.

Filed Sep. 17, 1979, Ser. No. 76,388
Int. Cl.³ G21C *19/20*
U.S. Cl. 376—268 **18 Claims**



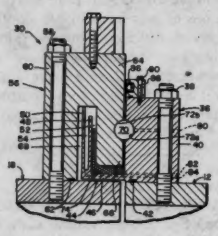
8. In a fuel handling mechanism for a nuclear reactor which includes a grapple positioning arm adapted to support a grapple head generally adjacent one end of said positioning arm, means supporting said positioning arm for pivotal movement about a pivot axis transverse to its longitudinal length, and actuator means operatively associated with said positioning arm and operative to pivot said arm about its pivot axis so as to enable selective positioning of said grapple head; the improvement wherein said actuator means comprises a thermally activated linkage arrangement including a first link member defining a bore therein opening outwardly of an end of said link member, a second link member having at least a portion thereof adapted to be received within said bore and sized to establish an interference fit between the outer surface of said second link member and the inner bore surface of said first link member sufficient to prevent relative movement between said first and second link members when disposed at or below a predetermined temperature but enabling relative longitudinal movement between said first and second link members when at least the interfitting portion of said first link member is disposed at a temperature above said predetermined temperature, said interfitting portions of said first and second link members having different coefficients of thermal expansion, and heating

means operatively associated with said interfitting portion of said first link member in a manner to enable selective heating thereof so as to reduce said interference fit to substantially zero and facilitate relative longitudinal movement between said first and second link members.

4,330,370
SEAL AND BEARING ARRANGEMENT FOR USE IN A NUCLEAR REACTOR

Joseph M. Kazan, New Stanton; John E. Sharbaugh, Acme, and William C. Ritz, Greensburg, all of Pa., assignors to Electric Power Research Institute, Palo Alto, Calif.

Filed Jun. 18, 1979, Ser. No. 49,453
Int. Cl.³ G21C *17/20*
U.S. Cl. 376—200 **11 Claims**



1. A combination seal and bearing arrangement for use in a nuclear reactor which includes a vertically extending vessel containing therein a number of components and a vessel cover located over the top of said vessel, said cover including first rotatable plug means which serves to perform certain position related functions on certain ones of said components and second means surrounding said plug means and, together with the latter, defining an annular opening therebetween, said combustion seal and bearing arrangement comprising:

stationary means fixedly mounted with said surrounding means and extending around the outside of said annular opening,

rotating mean fixedly mounted with said plug means for rotation therewith and extending around the inside of said annular opening, said rotating means together with said stationary means defining a circumferential path which extends outwardly from said annular opening to the ambient surroundings;

bearing means located between and engaging said stationary and rotating means in said path; and

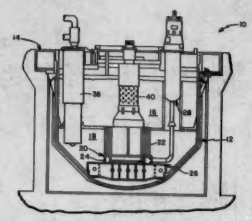
a single sealing and lubricating liquid filling an entire circumferential section of said path between said bearing means and said annular opening for sealing said path from the influx of ambient elements at said section and, at the same time, for lubricating said bearing means.

4,330,371
SUPPORT STRUCTURE CORE ASSEMBLY IN A NUCLEAR REACTOR

Robert F. Raymond, and Clive F. G. Dupen, both of Simsbury, Conn., assignors to Electric Power Research Institute, Inc., Palo Alto, Calif.

Filed Apr. 14, 1980, Ser. No. 139,879
Int. Cl.³ G21C *17/10*
U.S. Cl. 376—258 **10 Claims**

1. In a nuclear reactor of the type including a reactor vessel and a core assembly to be maintained in a fixed position within said vessel, a structural arrangement also located in said vessel for supporting said assembly in said fixed position, said arrangement comprising a plurality of components interconnected with one another by both welded joints and mechanical interlocks so as to define a unitary structure which supports said core assembly in said fixed position and which has sufficient structural integrity to support said assembly in a limited downwardly deflected position if all of said welded joints should fail, said plurality of components including a first group of horizontally extending, spaced apart and substantially parallel lower I-beams and a second group of horizontally extending, spaced apart and substantially parallel upper I-beams extending transverse to and across each of the lower I-beams in said first group of specific crossing point whereby to form an overall grillage of I-beams, each of said upper I-beams being interconnected to all of said lower I-beams at their crossing

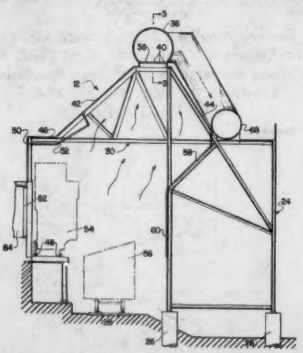


points by welded joints and also by mechanical interlocks such that said lower I-beams will support said upper I-beams in said limited downwardly deflected position in the event of total failure of the welded joints interconnecting said I-beams said components also including a box girder extending circumferentially around said grillage of I-beams, each of said upper and lower I-beams having opposite end sections, each of which is welded to and mechanically interlocked with said box girder at a predetermined point along its circumference.

4,330,372
COKE OVEN EMISSION CONTROL METHOD AND APPARATUS

Donald F. Cairns, Webster Groves, Mo., and Daniel J. Metzger, Belleville, Ill., assignors to National Steel Corporation, Pittsburgh, Pa.

Filed May 29, 1981, Ser. No. 268,253
Int. Cl.³ C10B *27/00, 33/00, 41/02*
U.S. Cl. 201—41 **23 Claims**



1. An emission control system for use in connection with a coal coking installation including a plurality of elongated coke ovens having removable doors at their opposed ends and being constructed in side by side relation in a battery having a pushing side and a coke side, a coke guide movable over tracks extending along the coke side of the battery for guiding coke pushed from an oven, and an open topped quench car for receiving incandescent coke from the coke guide, the quench car being supported on tracks extending along the coke side of

the battery below and spaced outwardly from the coke guide tracks, the emission control system comprising,

an elongated shed extending along the full length of the coke side of the battery and enclosing the coke side of the battery, the coke guide tracks, and the quench car tracks to capture and contain emissions from coke being pushed from the ovens and emissions escaping from the oven doors at the coke side of the battery during the coking process,

said shed including a sidewall spaced outwardly from the quench car tracks and having a bottom edge located below the level of the coke ovens and the open top of the quench car and spaced above the ground to permit air to enter the shed, and a roof spaced substantially above the top of the ovens,

said roof having a peak and an inclined panel extending downwardly from said peak in the direction of said ovens,

a zoning duct supported above said roof and extending along said peak substantially the full length of said shed, said zoning duct having an inlet opening extending substantially its full length and communicating with the interior of said shed along said peak,

a main exhaust duct extending generally parallel to said zoning duct,

exhaust fan means connected with said main exhaust duct for inducing a flow of air through the main exhaust duct,

a plurality of offtake ducts connected between said main exhaust duct and said zoning duct at spaced points along the zoning duct, and

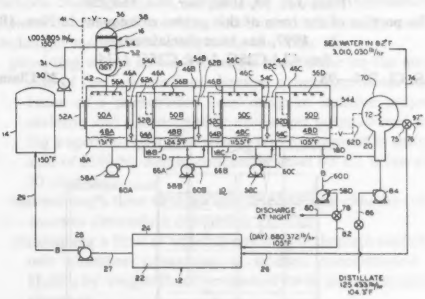
damper valve means associated with one of said ducts and operable to selectively restrict the flow of air and emissions through each of said offtake ducts to vary the flow of air and emissions from said shed through said zoning duct, said offtake ducts, and said main exhaust duct under influence of said exhaust fan means along the length of said shed.

4,330,373

SOLAR DESALTING PLANT

Philip J. Liu, Germantown, Wis., assignor to Aqua-Chem, Inc., Milwaukee, Wis.

Filed Jul. 25, 1980, Ser. No. 172,089
Int. Cl.³ B01D *1/26, 3/02*
U.S. Cl. 202—174 **5 Claims**



1. A distilling apparatus including:

energy input means consisting of a solar collector having an inlet and an outlet,

a storage tank having a capacity greater than that of the solar collector,

first liquid transfer means connected to the outlet of the solar collector and to said storage tank for delivering heated liquid from said solar collector to said storage tank at a first rate,

a flash evaporator,

second liquid transfer means connecting said storage tank to said flash evaporator for delivering the stored feed liquid to said flash evaporator at a second rate which is lower than said first rate,

said flash evaporator being maintained at a temperature lower than said heated feed liquid whereby a portion of said liquid evaporates,

a multi-effect evaporator,

vapor delivery means connecting said flash evaporator to said multi-effect evaporator for delivering the vaporized portion of the feed liquid from said flash evaporator as the vapor input to said multi-effect evaporator,

third liquid transfer means for delivering the unevaporated portion of the feed liquid from the flash evaporator as the liquid input to said multi-effect evaporator,

the successive effects of said multi-effect evaporator being connected and arranged so that the vapor generated in each effect comprises the heat input to the next succeeding effect whereby successive portions of the feed liquid are evaporated and condensed,

distillate collecting means for collecting distillate from the last effect as the product of the system, and

fourth liquid transfer means connected to the lowest temperature effect of said multi-effect evaporator and to said solar collector for recirculating at least a portion of the unevaporated feed liquid from the multi-effect evaporator to said solar collector during daylight hours and to discharge said unevaporated feed liquid during nighttime hours.

4. A distilling apparatus including:

energy imput means consisting of a solar collector having an inlet and an outlet,

a storage tank having a capacity greater than that of the solar collector,

first liquid transfer means connected to the outlet of the solar collector and to said storage tank for delivering heated liquid from said solar collector to said storage tank,

a flash evaporator,

second liquid transfer means connecting said storage tank to said flash evaporator for delivering the stored feed liquid to said flash evaporator,

said flash evaporator being maintained at a temperature lower than said heated feed liquid whereby a portion of said liquid evaporates,

a multi-effect film evaporator,

vapor delivery means connecting said flash evaporator to said multi-effect evaporator for delivering the vaporized portion of the feed liquid from said flash evaporator as the vapor input to said multi-effect evaporator,

third liquid transfer means for delivering the unevaporated portion of the feed liquid from the flash evaporator as the liquid input to said mult-effect evaporator,

the successive effects of said multi-effect evaporator being connected so that the vapor generated in each effect comprises the heat input to the next succeeding effect whereby successive portions of the feed liquid are evaporated and condensed, and

fourth liquid transfer means connected to the lowest temperature effect of said multi-effect evaporator and to said solar collector for recirculating a portion of the unevaporated feed liquid from the film evaporator to said solar collector during daylight hours and to discharge said unevaporated feed liquid during nighttime hours.

4,330,374

RECOVERY OF ANHYDROUS HYDROGEN IODIDE

Dennis R. O'Keefe, San Diego; Kenneth H. McCorkle, Jr., Del Mar, both of Calif., and Johannes D. de Graaf, The Hague, Netherlands, assignors to General Atomic Company, San Diego, Calif.

Filed Sep. 7, 1979, Ser. No. 73,566
Int. Cl.³ B01D *3/40*
U.S. Cl. 203—12 **16 Claims**

1. A method for obtaining relatively dry hydrogen iodide

from a mixture which includes HI, iodine and water, which method comprises

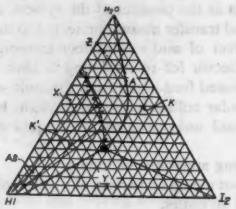
adjusting the pressure and composition of said mixture to superatmospheric pressures between 0° C. and 185° C., sufficient to provide two distinct liquid phases therefrom, one phase having a major portion of HI and not more than 1 weight % water;

recovering such one phase from the other of such phases.

6. A method for obtaining relatively dry hydrogen iodide from a mixture which includes HI, iodine and water, which method comprises

adjusting the pressure and composition of said mixture, by extractive distillation, to superatmospheric pressures between 0° C. and 185° C., to provide distinct liquid phases therefrom in an overhead exit stream, one phase having a major portion of HI and not more than 1 weight % water;

recovering such one phase from the other of such phases.



14. A method for obtaining relatively dry hydrogen iodide from a mixture which includes HI, iodine and water, which method comprises

adjusting the composition of the mixture by adding phosphoric acid to said mixture so that the resultant mixture has a composition which falls within one of the geometric regions designated A, B, C, D, E, F or G on the quaternary diagram of FIG. 3 and subjecting the mixture to a pressure at least nearly equal to the pressure of hydrogen iodide at the temperature thereof to cause distinct liquid phases to appear, one of which phases comprises HI and not more than about 1 weight percent H_2O based upon weight of HI, and

separating said one liquid phase from the remainder that is immiscible therewith by physically removing said one phase therefrom.

4,330,375

METHOD OF CLEANING CATHODES

Helmut Wörz; Hermann Leuprecht, and Jakob Biechl, all of Brixlegg, Austria, assignors to Vereinigte Metallwerke Ranshofen-Berndorf Aktiengesellschaft, Braunau am Inn, Austria

Filed Oct. 2, 1980, Ser. No. 193,083

Claims priority, application Austria, Oct. 2, 1979, 6428/79

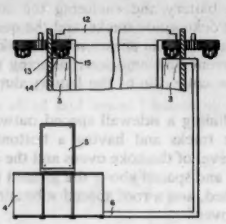
Int. Cl.³ C25C *1/12*; C25D *5/48*

U.S. Cl. 204—35 R **2 Claims**

1. A method of cleaning the surfaces of a copper cathode removed from an electrorefining bath comprising the steps of:

(a) supporting said cathode on an ultrasonic transducer immersed in a cleaning bath of heated degassed water with said surfaces of said cathode in contact therewith;

(b) subjecting said cathode in contact with said transducer to direct ultrasonic vibrations therefrom; and



(c) subjecting said surfaces of said cathode immersed in said cleaning bath to ultrasonic vibrations therefrom transmitted through said cleaning bath.

4,330,376

PROCESS FOR INHIBITING TITANIUM CORROSION

Sudarshan Lal, Glen Rock, N.J., and Richard V. Porcelli, Yonkers, N.Y., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Division of Ser. No. 17,756, Mar. 5, 1979, Pat. No. 4,238,551.

This application Jul. 17, 1980, Ser. No. 169,534

Int. Cl.³ C25D *3/50*; C23F *13/00*

U.S. Cl. 204—47 **11 Claims**

1. A process for decreasing the rate of corrosion attack by strong acid media upon an article comprising titanium or titanium alloy metal which is in contact with said media and which is used in the substantial absence of externally applied, anodically polarizing voltage to said article, which comprises providing a coating of metallic rhodium on at least a portion of the surface of said article which is intended for use in contact with said media.

4,330,377

ELECTROLYTIC PROCESS FOR THE PRODUCTION OF TIN AND TIN PRODUCTS

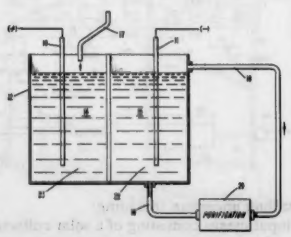
John A. Franks, Jr., Vermilion, Ohio, assignor to Vulcan Materials Company, Birmingham, Ala.

Filed Jul. 10, 1980, Ser. No. 168,254

The portion of the term of this patent subsequent to Nov. 18, 1997, has been disclaimed.

Int. Cl.³ C25G *1/24*; C25C *1/14*

U.S. Cl. 204—93 **30 Claims**



1. An electrolytic process for the production of tin or tin salts in an electrolytic cell, comprising an anode compartment and a cathode compartment, each compartment containing an electrolyte solution, and a cationic permselective barrier between the anode and cathode compartments comprising introducing a soluble tin salt or tin acid into the cathode compartment of the electrolytic cell, applying direct current to the anode and cathode to produce tin on the cathode in the cath-

ode compartment while substantially simultaneously preventing migration of anions between the cathode and anode compartments and allowing migration of protons from the anode to cathode compartments by maintaining an electrolyte fluid impermeable cationic permselective barrier between the anode and cathode, removing produced gas from the anode compartment and removing the tin or tin salts from the cathode compartment.

4,330,378
ELECTROLYSIS CELL AND METHOD FOR ELECTROLYTIC PRODUCTION OF HYDROGEN

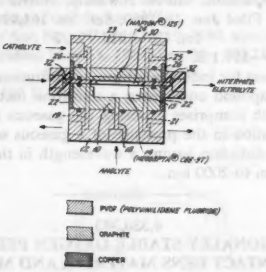
Dagmar Boltersdorf, Kreuzau; Robert Junginger, Jülich; Bernd D. Struck, Langerwehe, and Herbert Neumeister, Jülich, all of Fed. Rep. of Germany, assignors to Kernforschungsanlage Jülich GmbH, Jülich, Fed. Rep. of Germany

Filed Nov. 21, 1980, Ser. No. 208,933

Claims priority, application Fed. Rep. of Germany, Nov. 28, 1979, 2947789

Int. Cl.³ C25B 1/02, 1/22

U.S. Cl. 204—104 **17 Claims**



1. A process for producing hydrogen by electrolysis of an aqueous solution containing sulfurous and sulfuric acids in a three chamber electrolytic cell having an anode chamber, a cathode chamber and an intermediate chamber therebetween separated from said anode and cathode chambers by cation-exchanger membranes, comprising the steps of:

providing as the cation-exchanger membrane on the anode side of the intermediate chamber a heterogeneous membrane of a constitution combining an inactive polymer skeleton and a hydrophillic exchanger polymer and having a specific resistance which, when measured in sulfuric acid of 55% by weight concentration at 80° C., is less than 30 ohm-cm.;

maintaining a flow through said intermediate chamber of an aqueous electrolyte containing H_2SO_4;

maintaining a flow of aqueous electrolyte through said cathode chamber containing a smaller concentration of H_2SO_4 by weight than the electrolyte in said intermediate chamber;

maintaining a flow of aqueous electrolyte through said anode chamber containing sulfurous acid and containing a greater concentration of H_2SO_4 by weight than the electrolyte in said intermediate chamber, and

causing an electrolysis current to flow between the anode and the cathode, whereby hydrogen is evolved at the cathode, sulfurous acid is oxidized to sulfuric acid at the anode and the cell voltage remains favorably low, because of the said properties of the cation-exchanger membrane provided between said intermediate chamber and said anode chamber.

4,330,379
LEACHING OF ZINC CONTAINING SULPHIDE MINERALS

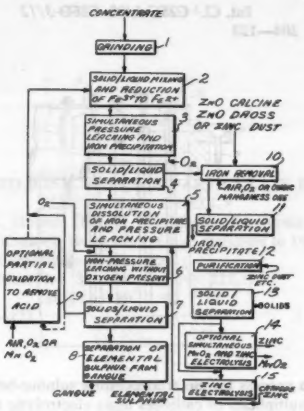
Bernard Verbaan, Fontainebleau, South Africa, assignor to National Institute for Metallurgy, Randburg, South Africa

Continuation-in-part of Ser. No. 113,284, Jan. 18, 1980, Pat. No. 4,274,931. This application Feb. 3, 1981, Ser. No. 231,477

Claims priority, application South Africa, Jan. 24, 1979, 79/0294; Aug. 14, 1980, 80/4989

Int. Cl.³ C25C 1/16

U.S. Cl. 204—119 **13 Claims**



1. A process for the treatment of zinc sulphide containing materials comprising the steps of:

(i) contacting in a first leaching stage at a temperature of from 70° C. to 119° C. at elevated pressure and under oxidising conditions, a sub-divided zinc sulphide containing material with an aqueous leach solution which has dissolved therein zinc and impurities, from 5 to 50 g/l iron, together with a maximum of 20 g/l sulphuric acid to dissolve zinc and other soluble metals in the zinc sulphide containing material by the oxidative action of ferric ions formed by the contemporaneous oxidation of ferrous ions to their ferric state and cause precipitation of iron;

(ii) separating the solids and leach liquor resulting from such first leaching stage;

(iii) subjecting the leach liquor obtained in step (ii) to any required purification steps followed by electrowinning of zinc therefrom to leave a spent electrolyte having regenerated sulphuric acid therein;

(iv) contacting, in a second leaching stage, and at elevated temperature of from 70° C. to 119° C. and elevated pressure under oxidising conditions, spent electrolyte resulting from step (iii) above with the solids resulting from step (ii) above to cause redissolution of iron precipitate and the further dissolution of zinc and metal impurities from the residue of the zinc sulphide containing material by the oxidative action of ferric ions resulting from the dissolution of iron precipitate and also formed by the co-temporaneous oxidation of ferrous ions to the ferric state, said second leaching stage being terminated only when at least sufficient ferric ions are present to complete the leaching of the zinc sulphide containing material;

(v) carrying out a third leaching stage with the solids and liquids of the second leaching stages still in contact but under substantially ambient pressure, in the absence of free oxygen and at temperatures of up to the boiling point of the solution;

(vi) separating the solids and leach solution resulting from step (v) and;

(vii) utilising the leach solution resulting from step (vi) as at

least the major portion of the aqueous leach solution employed in step (i).

4,330,380

ELECTRODEPOSITION OF SULFUR-BEARING NICKEL

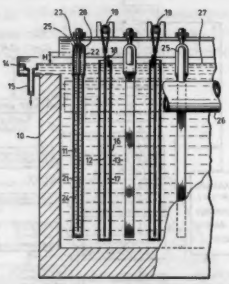
Ronald Parkinson, and Robert W. Howard, both of Thornhill, Canada, assignors to Falconbridge Nickel Mines Limited, Thornhill, Canada

Filed Nov. 13, 1980, Ser. No. 206,469

Claims priority, application United Kingdom, Nov. 21, 1979, 7940202

Int. Cl.³ C25C *1/08;* C25D *3/12*

U.S. Cl. 204—123 **4 Claims**



1. In a process for electrodepositing sulphur-bearing nickel onto a multiplicity of cathodes in an electrolytic cell from an aqueous electrolyte solution, said cell having weir means and containing anodes each of which is surrounded by a diaphragm forming an anode compartment enclosing anolyte therein, the improvement comprising using an electrolyte containing nickel ions, chloride ions and at least one thiocyanate compound selected from the group consisting of alkali, ammonium and alkaline earth metal thiocyanate and maintaining the electrolyte at different levels within and without the anode compartments, by

(i) adding fresh electrolyte outside the anode compartments,

(ii) withdrawing electrolyte by the weir means, outside the anode compartments below the anolyte levels, and,

(iii) simultaneously withdrawing anolyte and chlorine gas by suction from the anode compartments above the electrolyte level of the cell outside the anode compartments.

4,330,381

METHOD FOR CONTAINERLESS PORTABLE ELECTRO-POLISHING

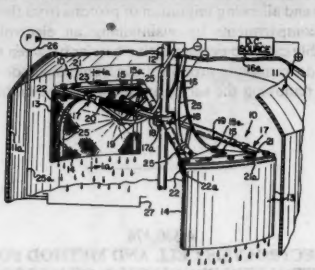
John F. Jumer, 16 W. 131 Timber Trails Dr., Oak Brook, Ill. 60521

Division of Ser. No. 943,371, Sep. 18, 1978, Pat. No. 4,190,513. This application Sep. 17, 1979, Ser. No. 76,445

Int. Cl.³ C25F *3/16*

U.S. Cl. 204—129.6 **3 Claims**

1. In a method of electro-polishing a surface of a metal object including the steps of: positioning the surface of a flexible foraminous cathode a predetermined distance from said surface to be electro-polished; introducing and maintaining an electrolytic bath between said cathode and said surface to be electro-polished; charging said cathode negatively; and charging said object positively; the improvement wherein the step of introducing and maintaining said electrolytic bath includes the steps of: positioning a liquid-retaining di-electric material of pre-determined thickness between said cathode and said surface to be electro-polished; and spraying said electrolytic bath through said foraminous cathode to wet said liquid-retaining di-electric member and maintain said member and said cathode against said surface; said spraying exerting sufficient pressure over the back of said cathode and said liquid-retaining di-electric material to conform said cathode and said liquid-retaining



di-electric material to the shape of said surface to be electro-polished.

4,330,382

SYNTHESIS PROCESS USING PHOTO-INDUCED DELIGANDATION

James T. Yardley, Morristown; Alan M. Rosan, and Eva L. Menger-Hammond, both of Madison, all of N.J., assignors to Allied Corporation, Morris Township, Morris County, N.J.

Filed Jun. 23, 1980, Ser. No. 161,999

Int. Cl.³ B01J *19/12*

U.S. Cl. 204—157.1 R **20 Claims**

1. A process for inducing a ligand substitution reaction in a gaseous compound comprising a transition metal and a first ligand, which comprises exposing the gaseous compound to optical radiation in the presence of a gaseous second ligand, said optical radiation having a wavelength in the range from about 150 nm to 2000 nm.

4,330,383

DIMENSIONALLY STABLE OXYGEN PERMEABLE HARD CONTACT LENS MATERIAL AND METHOD OF MANUFACTURE

Edward J. Ellis, Rowley, and Louis Mager, Sudbury, both of Mass., assignors to Polymer Technology Corporation, Wilmington, Mass.

Continuation of Ser. No. 925,709, Jul. 18, 1978, abandoned. This application Jul. 28, 1980, Ser. No. 173,102

Int. Cl.³ C08J *3/28;* C08F *30/08;* G02C *7/04*

U.S. Cl. 204—159.13 **23 Claims**

1. A method of improving dimensional stability of polymeric materials useful for hard contact lenses,

said method comprising selecting a polymeric material formed from a siloxanyl alkyl ester vinyl monomer and at least one other organic unsaturated copolymeric monomer to a solid state having a minor amount of unreacted monomer and

exposing said material to high energy radiation to reduce the amount of unreacted monomer and improve dimensional stability.

4,330,384

PROCESS FOR PLASMA ETCHING

Sadayuki Okudaira; Keizo Suzuki; Shigeru Nishimatsu, and Ichiro Kanomata, all of Kokubunji, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 29, 1979, Ser. No. 89,093

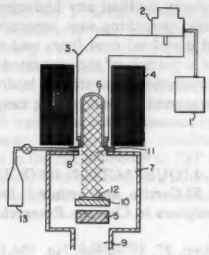
Claims priority, application Japan, Oct. 27, 1978, 53-131622; Dec. 1, 1978, 53-164644

Int. Cl.³ C23F *1/02;* H05H *1/24*

U.S. Cl. 204—192 E **28 Claims**

1. A process for plasma etching which comprises etching a material to be etched with a plasma in contact with said material, said plasma being formed by absorbing a micro-wave

generated by a magnetron in an etching gas, said plasma being formed in a mirror magnetic field, formed by a magnetic field

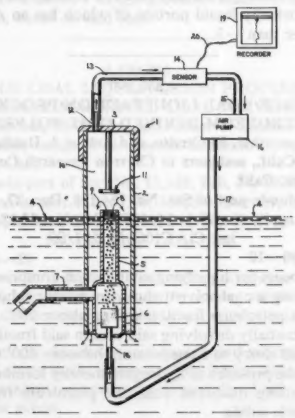


coil, at a position such that ions of said plasma can contact said material, wherein the etching gas contains at least SF_6.

4,330,385
DISSOLVED OXYGEN MEASUREMENT INSTRUMENT

Robert M. Arthur; Jerome J. Triatik; Robert M. Guell, and John F. Masters, all of Fond du Lac, Wis., assignors to Arthur Technology, Inc., Fond du Lac, Wis.

Continuation of Ser. No. 157,524, Jun. 9, 1980, abandoned. This application May 11, 1981, Ser. No. 262,185
Int. Cl.³ G01N 27/46
U.S. Cl. 204—195 R 3 Claims



1. An instrument for measuring the amount of oxygen in a body of liquid, which comprises:

an enclosure disposed over the body of liquid to entrap a volume of air, the enclosure including:

(a) an enclosed side wall which is partially submerged in the body of liquid,

(b) a bottom which has an opening which enables sample liquid to partially fill the enclosure,

(c) a top wall which entraps air inside the enclosure,

(d) an intake pipe mounted to the enclosure and providing a liquid passage through the side wall, and

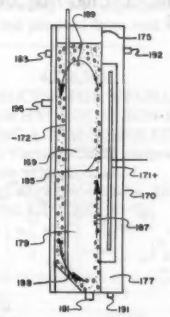
(e) a chimney mounted inside the enclosure and connected to the intake pipe to direct liquid therefrom upward into contact with the entrapped air, and

in which said entrapped volume of air is circulated by an air pump connected to the enclosure with a first tube which communicates with the entrapped air inside the enclosure and with a second tube which communicates with the interior of said chimney and an oxygen concentration sensor mounted for contact with said entrapped volume of air to measure the amount of oxygen therein and to thereby indirectly measure the amount of dissolved oxygen in the body of liquid.

4,330,386
COMBINED ION-EXCHANGE PARTICULATE BED ELECTROLYTIC CELL

K. A. Korinek, Mentor, Ohio; R. E. Anderson, Sunnyvale, Calif., and M. G. Konicek, Brecksville, Ohio, assignors to Diamond Shamrock Corporation, Dallas, Tex.

Filed Dec. 31, 1980, Ser. No. 222,275
Int. Cl.³ C25C 7/00, 7/02
U.S. Cl. 204—223 2 Claims



1. Apparatus for concentration and recovery of metal ions present in a fluid in a relatively low concentration comprising:

a container including a porous particulate mass of ion exchange resin;

fluid handling means for transferring a relatively large quantity of the fluid through the container, for controlling the flow of the fluid through the container, for providing fluid storage capacity and for removing fluid remaining in the container following a transfer;

a quantity of a regeneration fluid;

an electrolytic cell including: particles circulating between a cathode current feeder and a point at least intermediate the cathode current feeder and an anode, and a fluid distribution means arranged whereby fluid passing the fluid distribution means promotes particle movement within the particulate bed electrolytic cell;

regeneration fluid handling means for passing the regeneration fluid through the ion exchange container and for containing a working quantity of the regeneration fluid;

recovery fluid handling means for circulating the regeneration fluid through the fluid distribution means and for containing a working quantity of the regeneration fluid; and

at least one fluid interconnection between the regeneration fluid handling means and the recovery fluid handling means for transferring regeneration fluid therebetween.

4,330,387
MODIFIED CARBON OR GRAPHITE FIBROUS PERCOLATING POROUS ELECTRODE, AND ELECTROCHEMICAL REACTORS FITTED WITH SUCH AN ELECTRODE

Michel Astruc, Pau; Pierre-Yves Guyomar, Ploufragan, and Catherine Lestrade, Latresne, all of France, assignors to Societe Nationale Elf Aquitaine, Paris, France

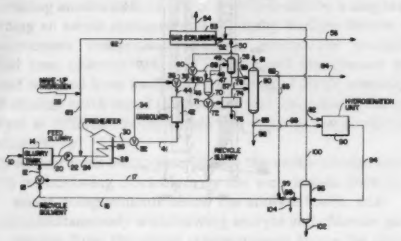
Filed Dec. 16, 1980, Ser. No. 216,925
Claims priority, application France, Dec. 18, 1979, 79 30929
Int. Cl.³ C25B *9/00, 11/14*
U.S. Cl. 204—275 **7 Claims**

1. A fibrous percolating porous electrode comprising a fibrous carbon or graphite porous matrix impregnated with a surface active agent having an apparent density in relation to water, in the wetted state, between 1.6 and 3 times the apparent density in relation to water of the corresponding non-impregnated fibrous porous matrix in the wetted state.

4,330,388
SHORT RESIDENCE TIME COAL LIQUEFACTION PROCESS INCLUDING CATALYTIC HYDROGENATION

Raymond P. Anderson, Overland Park, Kans.; David K. Schmalzer, Englewood, Colo., and Charles H. Wright, Overland Park, Kans., assignors to The Pittsburg & Midway Coal Mining Co., Englewood, Colo.

Filed Sep. 9, 1980, Ser. No. 182,697
Int. Cl.³ C10G *1/00, 1/06*
U.S. Cl. 208—8 LE **32 Claims**



1. A process for producing a normally solid dissolved coal and a distillate liquid product from a raw coal feed which comprises continuously passing a feed slurry comprising said raw coal and a recycle solvent oil together with hydrogen through a preheating-reaction zone, the hydrogen pressure in said preheating-reaction zone being at least 1500 psig, reacting said slurry in said preheating-reaction zone at a temperature in the range of between about 455° and about 500° C. to dissolve said coal to form normally liquid coal and normally solid dissolved coal, maintaining a total slurry residence time within said temperature range at a finite value in the range of above 0 to about 0.2 hour, continuously withdrawing reaction effluent, continuously and directly contacting said reaction effluent with a quenching fluid to substantially immediately reduce the temperature of said reaction effluent to a temperature which is sufficiently below 425° C. to substantially inhibit polymerization, performing said reaction under conditions of temperature, hydrogen pressure and residence time such that the distillate liquid product of said reaction boiling within the range C_5 to 454° C. is an amount at least equal to that obtainable from said reaction by performing said process under the same conditions except for a total slurry residence time of 0.3 hour before quenching, separating said reaction effluent into fractions without hydrogenative reaction of said reaction effluent subsequent to quenching and before said separation step, one fraction comprising a first solvent boiling range liquid and a second fraction comprising normally solid dissolved coal, recycling said first solvent boiling range liquid as recycle solvent for forming said feed slurry without any hydrogenative reaction thereof following said quenching step, separating a portion of said normally solid dissolved coal from said second fraction and passing at least a portion of the separated normally solid dissolved coal and hydrogen to a catalytic hydrogenation zone for conversion to a second solvent boiling range liquid.

4,330,389
COAL LIQUEFACTION PROCESS

Joel W. Rosenthal, El Cerrito, and Arthur J. Dahlberg, Pinole, both of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Filed Dec. 27, 1976, Ser. No. 754,198
Int. Cl.³ C10G *1/06, 1/00*
U.S. Cl. 208—10 **29 Claims**

1. A process for liquefying coal, which comprises:
(a) forming a coal-solvent slurry by mixing subdivided coal with a solvent;
(b) substantially dissolving said coal in said solvent by heating said slurry to a temperature between 750° and 900° F. thereby forming a mixture comprising solvent, dissolved coal, and insoluble solids;
(c) contacting said mixture in a reaction zone with hydrogen and an externally supplied hydrocracking catalyst under hydrocracking conditions including a temperature below 800° F., and lower than the temperature to which said slurry is heated in Step (b); and
(d) withdrawing from said reaction zone an effluent stream, the normally liquid portion of which has an API gravity greater than −3.

4,330,390
TWO-STAGE COAL LIQUEFACTION PROCESS WITH PETROLEUM-DERIVED COAL SOLVENTS

Joel W. Rosenthal, El Cerrito, and Arthur J. Dahlberg, Pinole, both of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Continuation-in-part of Ser. No. 754,198, Dec. 27, 1976. This application Feb. 14, 1979, Ser. No. 12,185
Int. Cl.³ C10G *1/06, 1/00*
U.S. Cl. 208—10 **30 Claims**

1. A process for liquefying coal, which comprises:
(a) forming a coal-solvent slurry by mixing subdivided coal with a petroleum fraction boiling above 200° C.;
(b) substantially dissolving said coal in said fraction by heating said slurry to a temperature between 400° C. and 480° C. in the presence of hydrogen, thereby forming a mixture comprising dissolved coal, the petroleum fraction, and insoluble solids;
(c) contacting said mixture in a reaction zone with hydrogen and an externally supplied hydrocracking catalyst under hydrocracking conditions, including a temperature 55° to 85° C. lower than the temperature to which said slurry is heated in the dissolving step; and
(d) withdrawing from said reaction zone an effluent stream, the normally liquid portion of which has a specific gravity less than 1.0.

4,330,391
COAL LIQUEFACTION PROCESS

Joel W. Rosenthal, El Cerrito, and Arthur J. Dahlberg, Pinole, both of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Continuation of Ser. No. 754,198, Dec. 27, 1976. This application Feb. 25, 1980, Ser. No. 124,176
Int. Cl.³ C10G *1/06, 1/00*
U.S. Cl. 208—10 **21 Claims**

1. A process for liquefying coal, which comprises:

(a) mixing subdivided coal with a solvent to form a coal-solvent slurry;
(b) substantially dissolving said coal in said solvent by heating said slurry in a dissolving zone to a temperature in the range of 750° to 900° F. in the presence of added hydrogen and in the absence of any externally supplied catalyst, thereby forming a mixture comprising solvent, dissolved coal, and insoluble solids;
(c) passing at least a portion of said mixture containing said insoluble solids into a reaction zone and contacting said portion with hydrogen in the presence of a hydrocracking catalyst under hydrocracking conditions, including a temperature in the range of 650° to 750° F. and lower than the temperature in said dissolving zone; and
(d) withdrawing effluent from said reaction zone.

4,330,392
HYDROCONVERSION PROCESS

Roby Bearden, Jr.; Clyde L. Aldridge, and William C. Baird, Jr., all of Baton Rouge, La., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Aug. 29, 1980, Ser. No. 182,508
Int. Cl.³ C10G *1/06, 47/04, 47/02*
U.S. Cl. 208—10 **9 Claims**

1. In a hydroconversion process wherein a nitrogen-containing carbonaceous feed is contacted with a particulate vanadium-containing catalyst in the presence of added hydrogen at hydroconversion conditions in a hydroconversion zone, the improvement which comprises: hydroconverting said feed in the presence of a hydrogen halide in a mole ratio of 0.2:1 to 2.0:1 hydrogen halide to nitrogen in said feed, and said vanadium-containing catalyst being present in an amount ranging from about 0.1 to about 5 weight percent, calculated as elemental vanadium, based on said feed.

4,330,393
TWO-STAGE COAL LIQUEFACTION PROCESS WITH PETROLEUM-DERIVED COAL SOLVENTS

Joel W. Rosenthal, El Cerrito, and Arthur J. Dahlberg, Pinole, both of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Continuation-in-part of Ser. No. 12,185, Feb. 14, 1979, which is a continuation-in-part of Ser. No. 745,198, Dec. 27, 1976. This application Oct. 6, 1980, Ser. No. 194,730
Int. Cl.³ C10G *1/06, 1/00*
U.S. Cl. 208—10 **16 Claims**

1. A process for liquefying coal, which comprises:
(a) forming a coal-solvent slurry by mixing subdivided coal with a crude petroleum solvent or a petroleum-derived solvent;
(b) substantially dissolving said coal in said solvent by heating said slurry in the presence of hydrogen, thereby forming a mixture comprising solvent, dissolved coal, and insoluble solids;
(c) contacting at least a portion of said mixture containing said insoluble solids in a reaction zone with hydrogen and an externally supplied hydrocracking catalyst under hydrocracking conditions, including a temperature lower than the temperature of said dissolving step; and
(d) withdrawing from said reaction zone an effluent stream, having a normally liquid portion.

4,330,394
QUENCHING PROCESS

John O. H. Newman, Cheltenham, England, assignor to Coal Industry (Patents) Limited, London, England

Filed Oct. 7, 1980, Ser. No. 194,796
Claims priority, application United Kingdom, Oct. 26, 1979, 7937257
Int. Cl.³ C10C *1/00*; C10G *45/00*
U.S. Cl. 208—23 **8 Claims**

1. A method of treatment of tar vapors from the carbonization of coal, to produce a stabilized coal tar product comprising quenching the vapors to a temperature of below 400° C. by using a hydrogen donor liquid effective to donate hydrogen from itself to tar components under the process conditions in a weight ratio of 10:1 to 0.5:1 of the tar vapors.

4,330,395
PROCESS FOR THE CONVERSION OF HYDROCARBONS EMPLOYING A SULPHIDED FLUORINE-CONTAINING NICKEL-TUNGSTEN CATALYST

Gerard T. Pott, and Johannes C. M. Stuiver, both of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Division of Ser. No. 147,693, May 7, 1980, Pat. No. 4,279,778. This application Mar. 6, 1981, Ser. No. 241,191
Claims priority, application Netherlands, Jun. 5, 1979, 7904382
Int. Cl.³ C10G *11/08, 45/08*
U.S. Cl. 208—115 **1 Claim**

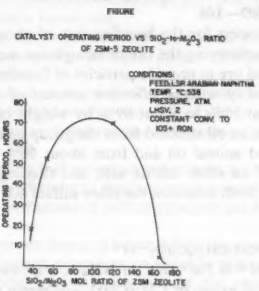
1. A process for the hydroconversion of hydrocarbon oil which comprises contacting said oil in a reaction zone at elevated temperature and pressure and in the presence of hydrogen with a sulphided fluorine-containing nickel-tungsten catalyst prepared by evaporating to dryness a solution containing a tungsten compound and an aluminum compound having an atomic ratio Al/w in the range of 0.3-1, calcining the resultant product at a temperature from about 500° C. to 700° C., impregnating the calcined product with a nickel compound, then sulphiding and fluorinating the impregnated product, and passing hydroconverted product from said reaction zone.

4,330,396
CYCLIC PROCESS FOR UPGRADING A HYDROCARBON OR HYDROCARBON-FORMING FEED USING A ZSM-5 ZEOLITE

Stephen J. Miller, El Cerrito, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Oct. 18, 1978, Ser. No. 952,420
Int. Cl.³ C10G *35/06*
U.S. Cl. 208—136 **7 Claims**

FIGURE



1. In a cyclical process for upgrading a feed selected from the group consisting of hydrocarbons, hydrocarbon precursors and mixtures thereof by steps including:
(1) contacting said feed with a ZSM-5 crystalline aluminosilica zeolite having catalytic activity, said contacting being at a temperature in the range of from about 300° to 650° C. and for a period determined by continuing said contacting until said activity, resulting in the main from concurrent deposition of carbonaceous by-product upon said zeolite, reaches a predetermined reduced level;
(2) recovering the resulting hydrocarbon product; and
(3) regenerating said activity by contacting the carbonaceous zeolite resulting from step (1) with a molecular oxygen-containing gas under carbon combusting conditions;
the improvement comprising at least substantially increasing

said operating period by carrying out said process using a ZSM-5 zeolite having a silica-to-alumina mol ratio in the range of from about 75 to 120.

4,330,397

FLUID-CONTACTING PROCESS

Robert P. Sieg, Walnut Creek, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Dec. 1, 1978, Ser. No. 965,650

Int. Cl.³ B01J *35/02*; C10G *25/00*

U.S. Cl. 208—149 **6 Claims**

1. In a process for contacting a fluid with at least two types of fluid-contacting particle disposed as discrete layers in a fixed bed and having different compositions and thereafter stopping said contacting, forming a mixture of said particle types and separating at least one of said particle types from said mixture by screening, the improvement which comprises:

(a) using as one of said particle types, particles having a convex shape; and

(b) using as another of said particle types, particles having a polylobal shape, a different nominal diameter, and a similar or greater ratio of geometric surface area to volume than said convex particles, and a similar or lower pressure drop for a volume of said polylobed particles than for the same volume of said convex particles, when measured at similar conditions.

4,330,398

FLOTATION OF PHOSPHATE ORES WITH ANIONIC AGENTS

John A. Alford, Hanahan, S.C., assignor to Westvaco Corporation, New York, N.Y.

Filed Oct. 12, 1979, Ser. No. 84,149

Int. Cl.³ B03D *1/02*

U.S. Cl. 209—166 **8 Claims**

1. A process for the beneficiation of phosphate ore which comprises slurrying the ore in an aqueous medium, classifying the slurried ore to provide particles of flotation size, conditioning the slurry with an effective amount of a combination of from about 50% to about 99% by weight of a fatty acid derived from an oil selected from the group consisting of vegetable oil and animal oil and from about 50% to about 1% by weight of an ether sulfate salt, and floating the desired ore values by froth flotation, the ether sulfate salt having the structure

$$R(OCH_2CH_2)_nOSO_3^-M^+$$

wherein M^+ is Na^+, K^+ or NH_4^+, n is from 1 to 6 and R is an alkylaryl group or $CH_3(CH_2)_x$—wherein x is from 6 to 20.

4,330,399

MAGNETIC SEPARATION METHOD

Jacob I. Dijkhuis, TC Zeist, Netherlands, assignor to Holec N.V., Utrecht, Netherlands

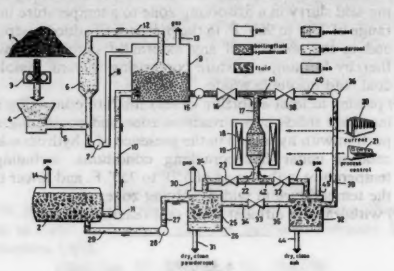
Filed Jan. 2, 1981, Ser. No. 222,158

Claims priority, application Netherlands, Jan. 10, 1980, 8000165

Int. Cl.³ B03C *1/00*

U.S. Cl. 209—214 **8 Claims**

1. A method of separating more magnetic particles from less magnetic particles on the basis of their respective magnetic properties comprising the steps of mixing a mixture of said particles with a liquified reactive gas to form a slurry thereof; subjecting said slurry to a magnetic field at a temperature at which said liquified reactive gas remains liquid; and, magnetically separating the more magnetic particles from said slurry under the influence of said magnetic field.



4,330,400

APPARATUS FOR SEPARATING DUST, DIRT AND THE LIKE FROM PARTICULATE MATERIAL

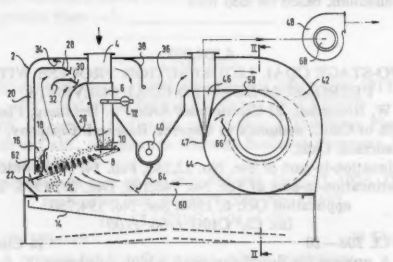
Willibald Schmidt, Eichstätter St. 49, D-8432 Beilngries, Fed. Rep. of Germany

Filed Jan. 30, 1981, Ser. No. 230,006

Claims priority, application Fed. Rep. of Germany, Jan. 30, 1980, 3003308

Int. Cl.³ B07B *3/02*

U.S. Cl. 209—474 **5 Claims**



1. In an apparatus for separating dust, dirt and the like from particulate material utilizing a flow of carrier fluid comprising:

a housing having a carrier fluid inlet proximate the bottom and a carrier fluid outlet proximate the top;

inlet means for introducing particulate material into the housing;

grid means disposed within the housing below said inlet means and intermediate the fluid inlet and the fluid outlet to spread the material across the housing;

means to cause a regulated velocity of carrier fluid to flow upwardly through said grid means toward said fluid outlet whereby heavier particulate material falls through said grid means and lighter particulate material is entrained and carried upwardly by the fluid passing through said grid means to thereby separate dirt, dust and light particles from said heavier particulate material;

a generally vertical collecting bin within the housing, the bin having an inlet positioned to collect a portion of said entrained particulate material precipitating from said upwardly passing carrier fluid and an outlet for discharging a regulated amount of said collected particulate material;

a generally vertical separator conduit having a fluid inlet below said collecting bin, said bin outlet operable to discharge said collected material into said separator conduit, whereby the fluid passing upwardly through said separa-

tor conduit entrains dust, dirt and light particles from said discharged collected material;

sensor means within the collecting bin for sensing the level of said material therein; and

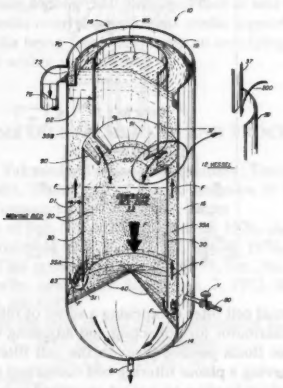
control means actuated by the sensor means for controlling the velocity of the carrier fluid flowing through the housing, said control means operating to reduce the velocity of the carrier fluid as the level of collected material in the collecting bin increases.

4,330,401

DYNAMIC CLARIFIER SYSTEM

Ronald A. Boze, Covington, and Anthony S. Canzoneri, Kenner, both of La., assignors to Process Development Company, Kenner, La.

Filed Sep. 17, 1980, Ser. No. 188,042
Int. Cl.³ B01D *23/10, 23/24*
U.S. Cl. 210—106 20 Claims



5. A dynamic clarifier apparatus comprising:

a. a vessel having a bottom portion and an upwardly extending continuous sidewall defining therewithin a liquid retaining space;

b. inlet means for adding a water stream to be clarified to said vessel;

c. discharge outlet means for discharging clarified water from said vessel;

d. weir means at the upper portion of said vessel sidewall for discharging excess fluid from said vessel responsive to a liquid level elevation therein to a level above said weir means;

e. a vertically extending separation wall, said separation wall terminating at its lower edge a distance above said bottom and at its upper edge a distance above said weir means, said vessel wall and said separation wall defining a bed area and a continuous flush annulus area which communicate in part at their respective lowermost portions;

f. a moving bed placed within said vessel, said moving bed being compacted at least during operation within a media bed area;

g. aeration means in said vessel creating an upflow in said vessel annulus, a portion of said media entering said annulus responsive to such upflow;

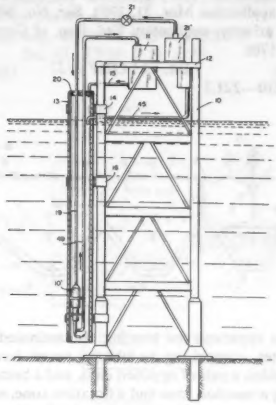
h. return zone means in said separation wall between the upper and lower edge portions thereof, and above the media upper surface level for returning media from said annulus to said media bed area.

4,330,402

WATER SAMPLING AND DISPOSAL APPARATUS FOR AN OFFSHORE OPERATING SITE

Harry P. LeBoeuf, Morgan City, La., assignor to Texaco Inc., White Plains, N.Y.

Filed Oct. 9, 1980, Ser. No. 195,556
Int. Cl.³ E02B *3/20*
U.S. Cl. 210—170 4 Claims



1. The combination with a marine structure positioned at an offshore body of water and being communicated with a source of process gas resulting from a hydrocarbon producing operation, which operation further yields a supply of an immiscible dispersion liquid comprising waste water and hydrocarbon liquid, of

an upstanding elongated disposal caisson communicated with said immiscible dispersion liquid supply for effecting a gravity separation of the water component thereof from the hydrocarbon liquid, and a discharge port positioned at the disposal caisson lower end,

a pump positioned at the caisson lower end and including means forming coaxially arranged power chamber and collecting chamber,

a piston slidably received in reciprocal movement between advanced and retracted positions in each of said respective power and collecting chambers, and being connected by a common piston rod,

means communicating said power chamber with a source of a pressurized gas whereby to displace piston in said power chamber when an amount of said pressurized gas is introduced thereto,

a passaged panel means disposed intermediate the respective power and collecting chambers to slidably register said piston rod therein, and to communicate the respective chambers one with the other,

biasing means engaging at least one of said pistons to urge the same into a retracted position at one end of the respective power and collecting chambers,

venting means communicating the power chamber with said immiscible dispersion liquid to permit a flow of the said liquid through the respective chambers and through said passaged panel during reciprocal movement of the piston through the respective chambers,

flow control means including, a first valved passage communicating the collecting chamber with liquid at the caisson lower end and being operable to permit a stream of said liquid to be drawn into said collecting chamber when the piston is moved to the retracted position, and

a second valved passage being operable to direct said stream of liquid from said collecting chamber during the piston discharge stroke, and

conduit means communicated with said second valved pas-

sage and extending to the water's surface whereby said stream of liquid can be delivered to the latter.

4,330,403

APPARATUS FOR PURIFYING POLLUTED LIQUIDS

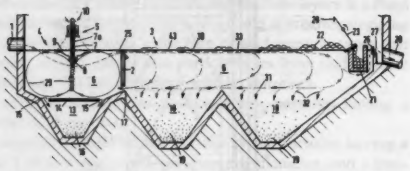
Hubert Fuchs, Im Stockthal, 5440 Mayen, Fed. Rep. of Germany

Continuation of Ser. No. 74,753, Sep. 12, 1979, abandoned. This application Mar. 31, 1981, Ser. No. 249,426

Claims priority, application Fed. Rep. of Germany, Sep. 25, 1978, 2841700

Int. Cl.³ C02F *1/22*

U.S. Cl. 210—221.2 **7 Claims**



1. In an apparatus for treating contaminated liquids, especially water, comprising an oblong vessel having a pair of opposed sides, a pair of opposed ends, and a bottom, a partition separating a reaction zone and a flotation zone, means disposed in said reaction zone for contacting the liquid with a gas, inlet means for feeding the liquid to said reaction zone, said flotation zone being in communication with said reaction zone and occupying the major portion of the vessel, a channel disposed at the end of said flotation zone remote from said reaction zone and disposed transverse to the longitudinal axis of the vessel, skimming means disposed at the end of said flotation zone for skimming floating material into said channel, and a spillway with a spillway edge situated behind said channel, the improvement which comprises:

(a) that portion of said vessel bottom disposed below said reaction zone being funnel-shaped, thereby defining a quiescent settling zone for collecting rapidly settling materials, the upper opening of said funnel-shaped settling zone being covered by a regulating plate disposed to form a surrounding clearance between the plate edge and the wall of the settling zone to permit the settling material to enter the settling zone, said regulating plate preventing turbulence in the reaction zone from resuspending the particles in the settling zone;

(b) that portion of said vessel bottom disposed below said flotation zone being formed such as to define at least one funnel-shaped additional quiescent settling zone adjacent to said first-mentioned settling zone, the upper edges of the walls of said adjacent settling zones forming an inverted substantially V-shaped floor portion;

(c) said partition being disposed above said inverted V-shaped floor portion with a gap therebetween, and extending to near the surface of the liquid in said apparatus; and

(d) a high-speed ejector aerator having mixing means arranged in said reaction zone with said mixing means immersed in the liquid to provide intensive contact between a gas and the liquid, to provide intensive turbulence in the liquid in said reaction zone, and to provide forced surface flow from said reaction zone to said flotation zone and forced recirculation flow from said flotation zone to said reaction zone;

(e) whereby circulation and intensive turbulence are caused in said reaction zone, a flotation current is produced in the area of the liquid surface flowing over said partition toward said skimming means thereby transporting the resultant floating mass of flotable contaminants to said skimmer, a main throughput current is produced flowing from said inlet, through said turbulence, over said partition, along the upper portion of said flotation zone, and to said spillway, and causing a sediment current flowing counter to the direction of said flotation current along the lower portion of said flotation zone, but above said additional settling zone, and under said partition into said reaction zone.

4,330,404

MULTIPLE CELL FILTER WITH BAFFLES

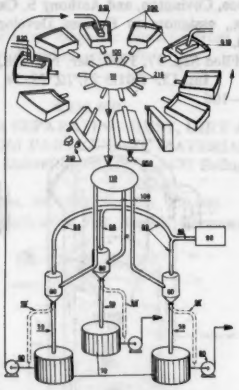
Armand L. Davister, Liege, Belgium, assignor to Societe de Prayon, Prayon, Belgium

Division of Ser. No. 730,657, Oct. 7, 1976, Pat. No. 4,172,791. This application Aug. 21, 1978, Ser. No. 935,618

Claims priority, application Luxembourg, Oct. 9, 1975, 73553

Int. Cl.³ B01D *35/08*

U.S. Cl. 210—247 **12 Claims**



1. Industrial cell filter comprising a series of filtering cells as well as a distributor for collecting and adjusting the distributing of those fluids passing through the cell filtering surface, each cell having a planar filtering bed comprised essentially of a filtering cloth bearing on a rigid apertured support retained above the cell bottom to leave a free space for the flowing of the fluids passing through said cloth, said bottom slanting towards a drain channel collecting said fluids, said channel itself slanting with the low end thereof opening into a discharge duct connected to the distributor, in which guide members are provided to fractionate, divide and direct said fluids as they enter the drain channel into substantially parallel adjacent streams flowing to said discharge duct, said guide members being comprised of a series of baffle-plates spread at the top of said drain channel along the length thereof, some distance above the channel bottom and slanting towards said discharge duct mouth, different ones of the baffle-plates having different angles of slant, the plate farthest from the low end of the drain channel having the steepest slant angle.

4,330,405

VACUUM DISC FILTER

Kent L. Davis, 3695 S. 2175 East, Salt Lake City, Utah 84109, and Lowell L. Palm, 1013 E. Lowell Ave., Salt Lake City, Utah 84102

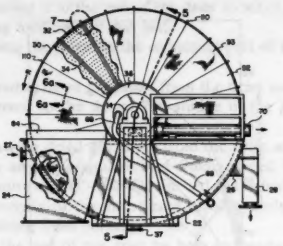
Filed Sep. 29, 1980, Ser. No. 191,693

Int. Cl.³ B01D *33/26*

U.S. Cl. 210—331 **11 Claims**

1. A filter disc comprising a continuous, one piece circular rim having a continuous groove on both of its side faces whereby said groove's opening is less in width at its mouth than elsewhere, a center hub, an annular manifold fixed to the outer surface of said hub said manifold having a plurality of spaced apart openings on one of its side faces and also along its

peripheral face, radial arms fixed at one end to said peripheral face of said manifold and at the other end to said inner wall of said circular rim, said radial arms having at least one groove in each of its side faces, said groove being in communication with said groove on said circular rim, a filter media support member



having openings fixed between said radial arms to provide an internal passageway, said passageway being in communication with said openings along said peripheral face of said manifold, and a filter media overlying said filter media support member said filter media being fixed thereto by an overlying caulking media carried within said grooves.

4,330,406

SEMIPERMEABLE MEMBRANE AND PROCESS OF MAKING SAME

Takezo Sano, Takatsuki; Takatoshi Shimomura, Toyonaka, and Masao Sasaki, Ibaragi, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

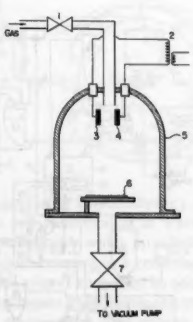
Continuation of Ser. No. 667,342, Mar. 16, 1976, abandoned, which is a division of Ser. No. 503,701, Sep. 6, 1974, Pat. No. 3,992,495. This application Aug. 27, 1979, Ser. No. 70,692

Claims priority, application Japan, Sep. 7, 1973, 48/101417; May 23, 1974, 49/58578

The portion of the term of this patent subsequent to Nov. 16, 1993, has been disclaimed.

Int. Cl.³ B01D *31/00*

U.S. Cl. 210—500.2 **11 Claims**



1. A semipermeable membrane for separating substances prepared by

exposing a shaped article of a water-soluble polymer or of a mixture of a water-soluble polymer and a water-insoluble polymer wherein the ratio of the water-soluble polymer to the water-insoluble polymer is 1 to 0.1–0.3 by weight to a plasma of a gas selected from the group consisting of helium, argon, nitrogen, hydrogen, oxygen, carbon monoxide, carbon dioxide, ammonia, a hydrocarbon having 1 to 10 carbon atoms, an epoxide having 2 to 10 carbon atoms, an alkylamine, or a mixture thereof to crosslink the surface layer of the shaped article, and then removing the uncrosslinked portions by washing with water.

4,330,407

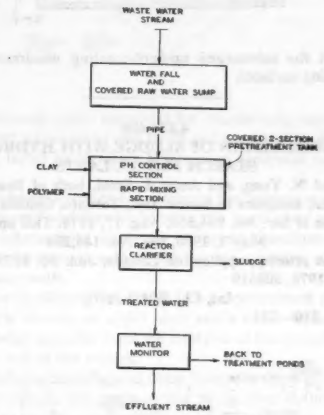
PROCESS FOR CLARIFYING ALGAE-LADEN WASTE WATER STREAM

David A. Shermer; Parsons P. Jim, both of Lake Charles, La., and Dale R. Laurance, Trumbull, Conn., assignors to Olin Corporation, New Haven, Conn.

Filed Aug. 29, 1980, Ser. No. 182,339

Int. Cl.³ C02F *1/56, 3/32*

U.S. Cl. 210—602 **21 Claims**



1. A process for clarifying an algae-laden waste water stream, said waste stream having suspended solids containing algae with oxygen bubbles attached thereto comprising:

(a) deaerating said waste water stream containing algae to remove at least a portion of the gaseous oxygen attached to said algae in said waste water stream;

(b) passing the waste water stream through a substantially light-free environment for sufficient time to cause at least a major portion of said algae to revert to its nocturnal phase, wherein the oxygen bubbles attached to said algae are smaller or absent;

(c) then adding a sufficient amount of at least one coagulation aid to said waste water stream containing algae in its nocturnal phase to cause coagulation of at least a portion of said suspended solids while in a substantially light-free environment; and

(d) then settling the coagulated solids in said waste water stream while in a substantially light-free environment in order to form a waste sludge of said coagulated solids and an effluent water stream having a lower amount of total suspended solids than said waste water stream entering step (a).

4,330,408

AQUEOUS WASTE TREATMENT

Charles A. McClure, Malvern, Pa., assignor to Crane Co., New York, N.Y.

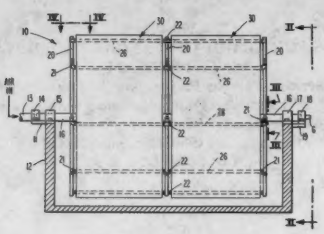
Filed Apr. 9, 1979, Ser. No. 28,081

Int. Cl.³ G02F *3/08*

U.S. Cl. 210—619 **24 Claims**

1. In bio-oxidative treatment of aqueous waste wherein supporting surfaces for oxidative microorganisms are rotated about a substantially horizontal axis extending along the interface between a body of aqueous waste and an overlying atmo-

sphere, the improvement comprising conducting oxidative gas radially outward from the axis and releasing it bubble-wise



adjacent the submerged upward-rotating quadrant of such supporting surfaces.

4,330,409

DESTABILIZATION OF SLUDGE WITH HYDROLYZED STARCH FLOCCULANTS

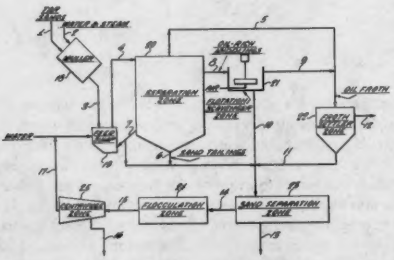
Raymond N. Yong, and Amar J. Sethi, both of Beaconsfield, Canada, assignors to Suncor Inc., Toronto, Canada

Division of Ser. No. 934,560, Aug. 17, 1978. This application May 1, 1980, Ser. No. 145,296

Claims priority, application Canada, Jan. 30, 1978, 295881; Aug. 2, 1978, 308619

Int. Cl.³ B01D *21/01*

U.S. Cl. 210—731 **12 Claims**



1. In the process for the destabilization of colloidal sludge suspensions containing clay minerals or metal oxides-hydroxides, by treatment of said suspensions with a flocculating reagent to substantially separate water from suspended solids, the improvement wherein the flocculating reagent is a hydrolyzed wheat, corn or potato starch obtained by the aqueous hydrolysis of the starch in the presence of insoluble metal salts formed in situ.

4,330,410

SEPARATION OF LEUKOCYTES FROM LEUKOCYTE-CONTAINING SUSPENSION BY FILTRATION

Yoshinori Takenaka; Nobuaki Tsuda, and Toru Kuroda, all of Fuji, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

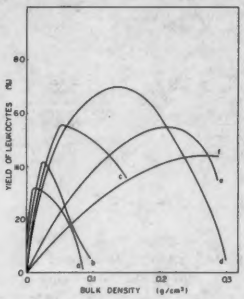
Continuation of Ser. No. 16,478, Mar. 1, 1979, abandoned. This application Jul. 21, 1980, Ser. No. 170,384

Claims priority, application Japan, Mar. 6, 1978, 53/24454; Mar. 6, 1978, 53/24455; Mar. 6, 1978, 53/24458; Mar. 6, 1978, 53/24476; Mar. 6, 1978, 53/24477; Oct. 26, 1978, 53/131010

Int. Cl.³ B01D *37/00*

U.S. Cl. 210—767 **3 Claims**

1. A method for separating unaltered and unaggregated leukocytes from an unaltered and unaggregated leukocyte-containing suspension, comprising the step of passing said leukocyte-containing suspension through a container provide with at least one inlet conduit means and with at least one outlet conduit means, said container having packed therein a mass of fibers which have no deleterious effects on leukocytes and other blood components and which possess an average fiber diameter of from 3 to 10 microns, said mass of fibers



having a bulk density of from 0.02 to 0.40 gram/cubic centimeter, and said fibers being of at least one type of fibers selected from the group consisting of cellulose acetate fibers, acrylonitrile polymer fibers, polyamide fibers and polyester fibers; whereby a substantial part of the unaltered and unaggregated leukocytes is entrapped in said mass of fibers and a leukocyte-poor liquid is obtained.

4,330,411

PROCESS FOR TREATING CLARIFIED SLUDGE

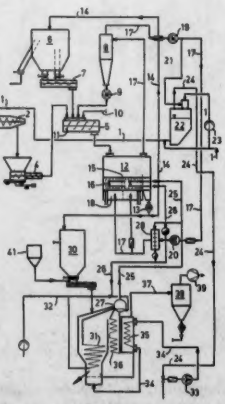
Gerd Florin, Vorberg; Friedrich Curtius, Lindau, and Arthur Dentler, Berg, all of Fed. Rep. of Germany, assignors to Escher Wyss Limited, Zurich, Switzerland

Filed May 20, 1980, Ser. No. 151,671

Claims priority, application Switzerland, May 28, 1979, 4941794/79; Fed. Rep. of Germany, Oct. 27, 1979, 2943558

Int. Cl.³ C02F *11/12*

U.S. Cl. 210—769 **12 Claims**



1. A method of treating an aqueous sludge containing combustible solid matter in a continuous process comprising the steps of

a. mechanically dewatering the sludge;

b. granulating the dewatered sludge;

c. drying the dewatered, granulated sludge in a drier containing a fluidized bed consisting of the granulate to be

dried at a temperature of 100°–300° C., but always less than the incineration point of the solid matter, the drying step involving the production of exhaust gases containing essentially inert steam;

d. withdrawing the exhaust gases from the drier and dividing same into two parts;

e. freeing one of the exhaust gas parts of dust and then recirculating it to the bed of the drier to serve as the sole fluidizing medium for that bed;

f. condensing the steam in the remaining part of the exhaust gases;

g. withdrawing dried granulate from the drier and adding a part thereof to the dewatered sludge in the granulating step;

h. withdrawing dried granulate from the drier and burning same to an ash granulate in a fluidized bed boiler at a temperature of 800°–900° C., the bed of the boiler consisting essentially of the introduced dried granulate and the ash resulting from burning;

i. heating the bed of the drier by heat exchangers incorporated in that bed which transfer to the bed only heat generated in the boiler; and

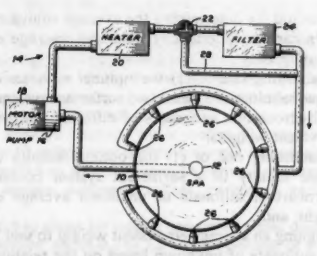
j. removing the granulated ash resulting from the burning of the dried granulate in the boiler.

4,330,412

HYDROTHERAPY DEVICE, METHOD AND APPARATUS

Stanley H. Frederick, Ramsey, N.J., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Jul. 5, 1977, Ser. No. 812,864
Int. Cl.³ E04H *3/20*
U.S. Cl. 210—805 **11 Claims**



8. A method of operating a hydrotherapy device to provide efficient operation and maintenance of water clarity and purity, said device including a water circulating loop having a two-speed motor close-coupled to a centrifugal liquid pump, a filter, a filter bypass circuit that may be selectively actuated, and water injecting means comprising the steps of:

energizing the motor at a low energy saving speed to achieve a low water circulation rate with the filter connected in the circulating loop to thereby maintain water clarity during periods of non-use;

energizing the motor at a higher speed during periods of use to achieve a higher water circulation rate and to provide a higher water velocity out of the water injecting means; and

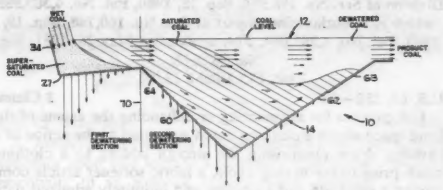
selectively bypassing the water around the filter during periods of use to thereby cause the water circulation rate to further increase to a yet higher circulation rate for improved therapeutic action.

4,330,413

METHOD AND APPARATUS FOR DEWATERING SLURRIES OF COAL AND THE LIKE

Donald C. Wilson, San Jose, Calif., assignor to FMC Corporation, Chicago, Ill.

Filed Dec. 1, 1980, Ser. No. 211,605
Int. Cl.³ B01D *33/22*
U.S. Cl. 210—806 **17 Claims**



1. A vibratory screen apparatus for continuously separating a liquid from a mixture of said liquid and a particulate material containing liquid by capillary action, said apparatus comprising:

means defining a trough for receiving the mixture at an inlet end thereof and for discharging the particulate material with substantially all water removed therefrom at an outlet end thereof, said trough having a bottom wall and two side walls;

means for oscillating the trough in a predetermined plane in order to convey an upper layer and a lower layer of the particulate material from the inlet end of the trough to the outlet end of the trough;

means defining an elongated sump formed in the bottom wall of the trough, said sump means being open at the top in order to receive said lower layer of the mixture conveyed in the trough, said sump means including a bottom opening disposed in a gaseous atmosphere and being located at a depth which is substantially greater than the capillary rise of liquid in the particulate material for causing the second layer to draw free and capillary liquid from the first layer, said sump having a width which increases in the outlet direction of the apparatus and decreases in the downward direction, said sump having a width at the top which is approximately one-third or less of the width of the trough; and

a screen covering said bottom opening, said screen allowing the liquid to drain from the mixture as the particulate material is being conveyed from the inlet to the outlet of the trough.

4,330,414

DISPERSIBLE HYDROPHILIC POLYMER COMPOSITIONS

Lonnie D. Hoover, Chapel Hill, Tex., assignor to NL Industries, Inc., New York, N.Y.

Filed Feb. 8, 1980, Ser. No. 119,805
Int. Cl.³ C09K *3/00*
U.S. Cl. 252—8.5 A **28 Claims**

1. A particulate flowable, polymer composition for use in thickening aqueous mediums comprising hydroxyethyl cellulose, and a solvating agent comprising a water miscible, polar organic liquid which when uniformly mixed with said hydroxyethyl cellulose in a weight ratio of hydroxyethyl cellulose to solvating agent of 1:2 produces a mixture with substantially no free liquid solvating agent present after remaining quiescent for one week at ambient temperature in a sealed container, said solvating agent being present in an amount such that said polymer composition remains a particulate, flowable material.

4,330,415
USE OF MIXTURE OF ALIPHATIC C_{10} BRANCHED OLEFINS IN AUGMENTING OR ENHANCING THE AROMA OF PERFUMES AND/OR PERFUMED ARTICLES

Richard M. Boden, Monmouth Beach; Lambert Dekker, Wyckoff; Frederick L. Schmitt, Holmdel, all of N.J., and Augustinus G. Van Loveren, Rye, N.Y., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Division of Ser. No. 188,576, Sep. 18, 1980, Pat. No. 4,303,555, which is a continuation-in-part of Ser. No. 160,788, Jun. 19, 1980, Pat. No. 4,287,084. This application May 28, 1981, Ser. No. 267,897

Int. Cl.³ D06M *13/02*

U.S. Cl. 252—8.6 **2 Claims**

1. A process for augmenting or enhancing the aroma of the head space above a clothing batch subjected to the action of a clothing dryer comprising the step of adding to a clothing batch prior to the drying cycle, a fabric softener article comprising a substrate and a coating and intimitely admixed with the coating a head space aroma augmenting or enhancing quantity of one or more diisoamylene-containing compositions produced by the step of reacting two moles of diisoamylene in the presence of an acid catalyst.

4,330,416
NORBORNYL ETHERS

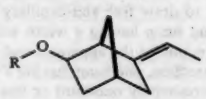
Mark A. Sprecker, Sea Bright, N.J., assignor to International Flavors & Fragrances Inc., New York, N.Y.

Division of Ser. No. 200,012, Oct. 23, 1980, Pat. No. 4,311,861. This application Jul. 6, 1981, Ser. No. 280,275

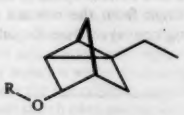
Int. Cl.³ D06M *13/18*

U.S. Cl. 252—8.9 **3 Claims**

1. A process for augmenting or enhancing the aroma of a fabric softener composition or dryer-added fabric softener article comprising the step of intimately admixing with at least a portion of said fabric softener composition or said dryer added fabric softener article, an aroma augmenting or enhancing quantity of at least one compound having a structure selected from the group consisting of:



and



wherein "R" represents C_3–C_6 alkyl; phenethyl; hydroxyl alkyl; alkoxy alkyl; allyl and cyclohexyl and the moieties "R" are the same in each of the molecules.

4,330,417
1-N-BUTOXY-1-ETHANOL ACETATE AND USES THEREOF FOR AUGMENTING OR ENHANCING THE AROMA OR TASTE OF CONSUMABLE MATERIALS

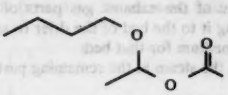
Richard M. Boden, Monmouth Beach, N.J., assignor to International Flavors & Fragrances Inc., New York, N.Y.

Division of Ser. No. 217,810, Dec. 18, 1980, Pat. No. 4,296,138, which is a continuation-in-part of Ser. No. 176,111, Aug. 7, 1980, Pat. No. 4,296,137. This application Jul. 29, 1981, Ser. No. 287,893

Int. Cl.³ D06M *13/18*

U.S. Cl. 252—8.9 **1 Claim**

1. The process for augmenting or enhancing the aroma of a dryer-added fabric softener article or a fabric softener composition comprising the step of adding to at least one component of a dryer-added fabric softener article or to a fabric softener composition, an aroma augmenting, modifying or enhancing quantity of 1-n-Butoxy-1-ethanol acetate having the structure:



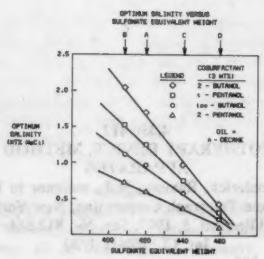
4,330,418
CHARACTERIZING HYDROCARBON SULFONATES AND UTILIZATION OF HYDROCARBON SULFONATES IN OIL RECOVERY

Gibert R. Glinsmann, and James H. Hedges, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Dec. 4, 1979, Ser. No. 100,086

Int. Cl.³ E21B *43/22*

U.S. Cl. 252—8.55 D **34 Claims**



1. A method for determining the average equivalent weight of a hydrocarbon sulfonate of unknown average equivalent weight, comprising:

(a) establishing one of (1) the optimal salinities or (2) the unique salinities of at least two surfactant systems containing hydrocarbon sulfonates of different, known average equivalent weights;

(b) establishing one of (1) the optimal salinity or (2) the unique salinity of a surfactant system containing said hydrocarbon sulfonate of unknown average equivalent weight; and

(c) assigning an average equivalent weight to said hydrocarbon sulfonate of unknown based on the relationship that the average equivalent weights of hydrocarbon sulfonates vary inversely and linearly as the optimal salinities or the unique salinities, respectively, of surfactant systems containing said hydrocarbon sulfonates vary.

7. A method for determining one of (1) the optimal salinity or (2) the unique salinity of a surfactant system of unknown optimal salinity or unique salinity, respectively, comprising:

(a) establishing the average equivalent weights of at least two hydrocarbon sulfonates contained in an equal number of surfactant systems of known optimal salinities or unique salinities, respectively;

(b) establishing the average equivalent weight of a hydrocarbon sulfonate contained in a surfactant system of unknown optimal salinity or unique salinity, respectively; and

(c) assigning an optimal salinity or unique salinity, respectively, to said surfactant system of unknown optimal salinity or unique salinity, respectively, based on the relationship that the optimal salinities, or the unique salinities, respectively, of surfactant systems vary inversely and

linearly as the average equivalent weights of said hydrocarbon sulfonates vary.

4,330,419

METHOD OF AND SOLVENT FOR REMOVING INORGANIC FLUORIDE DEPOSITS

Bobby E. Hall, Duncan, and Michael L. Walker, Marlow, both of Okla., assignors to Halliburton Company, Duncan, Okla.

Filed Oct. 20, 1980, Ser. No. 198,338
Int. Cl.³ C23G *1/02*; E21B *43/27*
U.S. Cl. 252—8.55 B **10 Claims**

1. A composition for dissolving insoluble fluoride deposits comprising:

(a) from about 5 to about 30% by weight of hydrochloric acid;

(b) from about 10 to about 20% by weight of methanol; and

(c) from about 2 to about 5% by weight of boric acid, said methanol and said boric acid having been premixed before being mixed with said hydrochloric acid.

4,330,420

LOW ASH, LOW PHOSPHORUS MOTOR OIL FORMULATIONS

William R. White, and John Reale, Jr., both of Wappingers Falls, N.Y., assignors to Texaco Inc., Del.

Continuation-in-part of Ser. No. 149,401, May 13, 1980, abandoned. This application Jul. 9, 1981, Ser. No. 281,637
Int. Cl.³ C10M *1/48*
U.S. Cl. 252—32.7 E **12 Claims**

1. A motor oil comprising:

about 2 to 10 weight percent of an alkenylsuccinimide dispersant;

about 0.5 to about 5 weight percent of magnesium or calcium, acetate, sulfonate, sulfate, carbonate and mixtures thereof;

about 0.5 to about 2.0 weight percent of a zinc dialkyl dithiophosphate;

about 0.2 to 2.0 weight percent of a dialkyldiphenylamine antioxidant;

about 0.2 to 4.0 weight percent of a sulfurized polyolefin antioxidant;

about 2 to about 10 weight percent of a first VI improver consisting of an ethylene-propylene copolymer;

from about 2 to about 10 weight percent of a second VI improver consisting of a methacrylate terpolymer;

the balance a hydrocarbon base oil.

7. An additive package for a motor oil comprising from about 4 to 10 weight percent of an alkenyl succinimide dispersant; about 0.5 to about 1.5 weight percent of magnesium or calcium acetate, sulfonate, sulfate, carbonate and mixtures thereof;

about 0.5 to about 2.0 weight percent of a zinc dialkyldithiophosphate; about 0.2 to 2.0 weight percent of a dialkyldiphenylamine antioxidant; about 0.2 to 4.0 weight percent of a sulfurized polyolefin antioxidant; about 2 to about 10 weight percent of a first VI improver consisting of an ethylene/propylene copolymer; and from about 2 to about 10 weight percent of a second VI improver consisting of a methacrylate terpolymer.

4,330,421

SULFURIZED PHENOL DERIVATIVES AND COMPOSITIONS THEREOF

Milton Braid, Westmont, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Jul. 11, 1980, Ser. No. 167,612
Int. Cl.³ C10M *1/54*
U.S. Cl. 252—42.7 **8 Claims**

1. A lubricant composition comprising a major amount of a hydrocarbyl medium selected from the group consisting of oils of lubricating viscosity and greases thereof and a minor stabilizer/detergent amount of a neutral or overbased calcium/transition metal phenol sulfide wherein said calcium/transition metal phenol sulfide has at least about 0.01 to about 10 wt. %, based on the total weight of said metal phenol sulfide composition of said transition metal, said transition metal being derived from a direct exchange reaction of said transition metal with calcium phenol sulfide.

3. The composition of claim 1 wherein the transition metal is selected from cobalt, iron and nickel.

4,330,422

TREATING COMPOSITION CONTAINING WHITE OIL

Sheila A. Tesch, Saint Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Filed Feb. 1, 1977, Ser. No. 764,569
Int. Cl.³ C11D *3/22*
U.S. Cl. 252—89.1 **5 Claims**

1. Method of treating a stainless steel surface comprising applying upon said surface a treating composition consisting essentially of an aqueous storage-stable emulsion of white mineral oil containing from about 20 to about 50 parts by weight white mineral oil having a Saybolt viscosity at 100° F. in the range of about 50 to about 380 Saybolt seconds, sufficient nonionic emulsion surfactant to produce said emulsion yet not so much surfactant as to leave a visible residue of same on the treated surface, and the balance of 100 parts being water, rubbing said surface to dislodge soil and wiping said surface to remove excess treating composition and removed soil, leaving on the treated surface a clear nonevaporating, even, non-streaked, thin film of white mineral oil.

4,330,423

PROCESS FOR THE PRODUCTION OF SOLID, POURABLE WASHING OR CLEANING AGENTS WITH A CONTENT OF A CALCIUM BINDING SILICATE

Heinz Smolka, Langenfeld, and Milan J. Schwuger, Haan, both of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Dusseldorf-Holthausen, Fed. Rep. of Germany

Continuation of Ser. No. 458,303, Apr. 5, 1974, abandoned. This application Jul. 7, 1977, Ser. No. 813,436
Claims priority, application Austria, Jun. 20, 1973, 8273/73; Sep. 25, 1973, 5448/73
Int. Cl.³ C01B *33/28*; C02F *1/42*; C11D *3/12, 11/00*
U.S. Cl. 252—99 **16 Claims**

1. In the process for the production of solid, pourable washing and cleaning agents for textiles comprising the steps of mixing the ingredients consisting essentially of from 5% to 30% by weight of at least one surface-active compound, from 2% to 45% by weight of non-aluminosilicate sequestering agents for calcium, from 0 to 50% by weight of wash alkalis not capable of sequestration, from 0 to 50% by weight of bleaches, with from 5% to 70% by weight of the product being produced on a dry basis of calcium binding compounds in the presence of sufficient water whereby said mixture is pumpable and converting the mixture in the absence of any bleaching components to a solid pourable product by drying, the improvement consisting of utilizing at least one compound inhibiting alkaline earth metal ion precipitation from aqueous solutions consisting of finely-dispersed, water-insoluble silicate compounds containing combined water as well as adhering water and having a calcium binding power when measured at 22° C. by the Calcium Binding Power Test Method set out in the specification, of at least 50 mg CaO/gm of anhydrous active substance and the formula on the anhydrous basis

$$(M_2O)_x.Al_2O_3.(SiO_2)_y$$

where M is an alkali metal, x is a number from 0.7 to 1.5, and y is a number from 1.3 to 4, in the moist state from its production in the form of an aqueous fluid suspension or an aqueous viscous paste, without interim drying after their production process, but after removal of at least some of the mother liquor

from their production process and replacement by water, as said calcium binding compound, and adding said optional bleach components.

11. In the process for the production of solid, pourable washing and cleaning agents for machine dishwashing comprising the steps of mixing the ingredients consisting essentially of from 10% to 60% by weight of at least one compound selected from the group consisting of alkali metal silicates, alkali metal carbonates, alkali metal hydroxides, organic phosphorus-containing complexing agents for calcium and mixtures thereof, from 0 to 10% by weight of compounds containing active oxygen or active chlorine, from 0 to 10% by weight of nonionic surface-active compounds, from 0 to 20% by weight of sodium sulfate and water, with from 10% to 65% by weight of the product being produced on a dry basis of calcium binding compounds in the presence of sufficient water whereby said mixture is pumpable and converting the mixture to a solid, pourable product by drying, the improvement consisting of utilizing at least one compound inhibiting alkaline earth metal ion precipitation from aqueous solutions consisting of finely-dispersed, water-insoluble silicate compounds containing combined water as well as adhering water and having a calcium binding power of at least 50 mg CaO/gm of anhydrous active substance when measured at 22° C. by the Calcium Binding Power Test Method set out in the specification and the formula on the anhydrous basis

$$(M_2O)_x.Al_2O_3.(SiO_2)_y$$

where M is an alkali metal, x is a number from 0.7 to 1.5, and y is a number from 1.3 to 4, in the moist state from its production in the form of an aqueous fluid suspension or an aqueous viscous paste, without interim drying after their production process but after removal of at least some of the mother liquor from their production and replacement by water, as said calcium binding compound.

4,330,424

FREE FLOWING BUILDER BEADS AND DETERGENTS

David Joshi, Piscataway, N.J., assignor to Colgate Palmolive Company, New York, N.Y.

Division of Ser. No. 973,962, Dec. 28, 1978, Pat. No. 4,276,326, which is a continuation-in-part of Ser. No. 661,471, Feb. 26, 1976, abandoned. This application Feb. 13, 1981, Ser. No. 234,565

Int. Cl.³ C11D *3/075, 3/08, 11/02, 17/06*

U.S. Cl. 252—135 **25 Claims**

1. A free flowing particulate base bead for a detergent composition having an internal skeletal structure and a porous outer surface produced by:

(a) hydrating a first quantity of anhydrous phosphate builder salt to the maximum in the presence of an alkali metal silicate using sufficient water to form an aqueous slurry;

(b) adding a second quantity of anhydrous phosphate builder salt to said aqueous slurry to form a crutcher mix, said addition being made under conditions which maintain said second quantity of phosphate builder in an anhydrous state; and

(c) spray drying said crutcher mix to form a particulate material, the weight ratio of said first quantity of builder salt to said alkali metal silicate being from about 1.5 to about 5 and the weight ratio of said first quantity of builder salt to said second quantity of builder salt being from about 0.3 to about 0.7.

25. A free flowing particulate detergent composition containing from about 2 to about 40 percent by weight of an organic material chosen from the group consisting of anionic, nonionic and cationic surface active agents and mixtures thereof produced by:

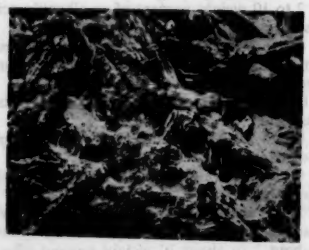
(a) hydrating to a maximum a first quantity of anhydrous phosphate builder salt in the presence of an alkali metal silicate using sufficient water to form an aqueous slurry;

(b) said hydrating step being performed at a temperature of at least about 140° F. and not greater than about 170° F;

(c) the weight ratio of said first quantity of builder salt to said silicate being from about 1.5 to about 5;

(d) raising the temperature of said aqueous slurry to more than about 170° F. and less than about 200° F;

(e) adding a second quantity of anhydrous phosphate builder salt to said aqueous slurry to form a crutcher mix, the weight ratio of said first quantity of builder salt to said second quantity of builder salt being from about 0.3 to about 0.7;



(f) supplying said crutcher mix to a spray drying tower;

(g) said aqueous slurry and said crutcher mix being maintained at temperatures of at least about 170° F. through steps (e) and (f);

(h) spraying said crutcher mix in said spray tower to produce spray dried base beads, each bead having an internal skeletal structural and a porous outer surface; and

(i) applying said organic material to said base beads such that said organic material is disposed within said base beads.

4,330,425

USE OF MIXTURE OF ALIPHATIC C_{10} BRANCHED OLEFIN EPOXIDES IN AUGMENTING OR ENHANCING THE AROMA OF ARTICLES SUBJECTED TO ACTION OF AQUEOUS HYPOCHLORITES

Richard M. Boden, Monmouth Beach; Lambert Dekker, Wyckoff; Frederick L. Schmitt, Holmdel, all of N.J., and Augustinus G. Van Loveren, Rye, N.Y., assignors to International Flavors & Fragrances Inc., New York, N.Y.

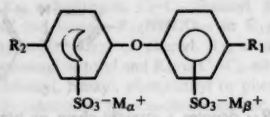
Continuation-in-part of Ser. No. 195,630, Oct. 9, 1980, which is a continuation-in-part of Ser. No. 160,788, Jun. 19, 1980, Pat. No. 4,287,084. This application Feb. 27, 1981, Ser. No. 231,773

Int. Cl.³ C11D *7/54, 3/395, 3/50*

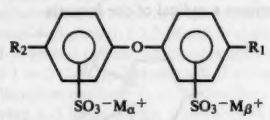
U.S. Cl. 252—187 H **5 Claims**

1. An aqueous alkali metal hypochlorite solution comprising as a sole detergent a composition of matter selected from the

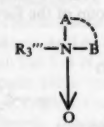
group consisting of (1) at least one substance defined according to the structure:



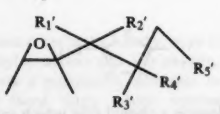
wherein at least one of R_1 and R_2 is C_{10}–C_{12} straight chain or branched chain alkyl; when one of R_1 or R_2 is C_{10}–C_{12} straight chain or branched chain alkyl the other of R_1 or R_2 is hydrogen; wherein M_α and M_β are the same or different and each represents alkali metal selected from the group consisting of sodium, potassium and lithium and (2) a mixture comprising a material having the structure:



and intimately admixed therewith a substance having the structure:



wherein R_3''' is straight chain alkyl; wherein more than 55% of the R_3''' moieties consist of straight chain alkyl having from 11 up to 13 carbon atoms and wherein A and B are each separately methyl or, taken together, complete a morpholine ring; and from 0.02% up to 0.2% of one or more diisoamylene epoxide-containing compositions defined according to the structure:



wherein R_1', R_2', R_3', R_4' and R_5' are the same or different and each represents hydrogen or methyl with the proviso that (i) the sum total of carbon atoms in R_1', R_2', R_3', R_4' and R_5' is three, and (ii) R_1' and R_2' represent hydrogen when R_5' represents methyl, and (iii) when either R_1' or R_2' is methyl, R_5' is hydrogen; said diisoamylene epoxide being capable of imparting to said alkali metal hypochlorite solution or to an article to which said alkali metal hypochlorite solution is applied, a woody, eucalyptol-like, minty aroma, hypochlorite solution having a pH of 11 up to 14.0.

4,330,426

CYCLOHEXYLBIPHENYLS, THEIR PREPARATION AND USE IN DIELECTRICS AND ELECTROOPTICAL DISPLAY ELEMENTS

Rudolf Eidenschink, Dieburg; Dietrich Erdmann, Mühltal; Joachim Krause, Dieburg, and Ludwig Pohl, Darmstadt, all of Fed. Rep. of Germany, assignors to Merck Patent Gesellschaft mit beschränkter Haftung, Darmstadt, Fed. Rep. of Germany

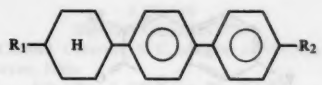
Filed Jul. 7, 1980, Ser. No. 166,663

Claims priority, application Fed. Rep. of Germany, Jul. 6, 1979, 2927277

Int. Cl.³ G02F *1/13;* **C09K** *3/34;* **C07C** *13/28, 21/24, 43/205, 69/017*

U.S. Cl. 252—299.63 **7 Claims**

1. A cyclohexylbiphenyl of the formula



wherein R_1 is alkyl of 1–12 C atoms and R_2 is alkyl, alkoxy or alkanoyloxy each of 1–12 C atoms and each optionally perfluorinated.

4. A liquid crystal dielectric, comprising at least two liquid crystal components, at least one being a compound of claim 1.

4,330,427

MIXTURES OF OPTICAL BRIGHTENERS

Thomas Martini, Bad Soden am Taunus; Rüdiger Erckel, Eppstein/Taunus; Horst Frühbeis, Kelkheim/Taunus; Günter Rösch, Bad Soden am Taunus, and Heinz Probst, Sulzbach, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Filed Jul. 16, 1980, Ser. No. 169,296

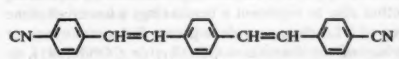
Claims priority, application Fed. Rep. of Germany, Jul. 21, 1979, 2929687

Int. Cl.³ C09K *11/06*

U.S. Cl. 252—301.24 **7 Claims**

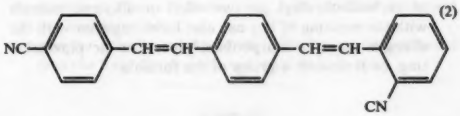
1. Mixtures of optical brighteners consisting of

(A) 0.05 to 0.95 part by weight of a mixture consisting of 0 to 80% by weight of the compound of the formula 1



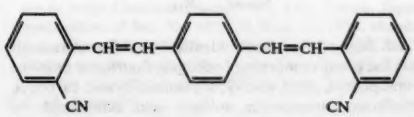
(1)

20 to 100% by weight of the compound of the formula 2



(2)

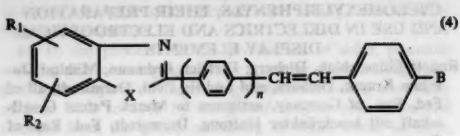
and 0 to 80% by weight of the compound of the formula 3



(3)

and

(B) 0.95 to 0.05 part by weight of one or more compounds of the formulae 4, 5, 6, 7 or 8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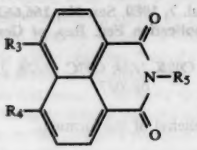
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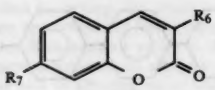
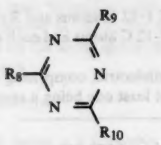
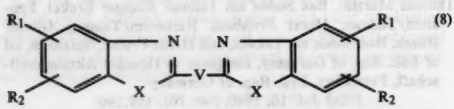
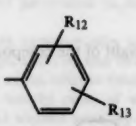

(6)


(7)

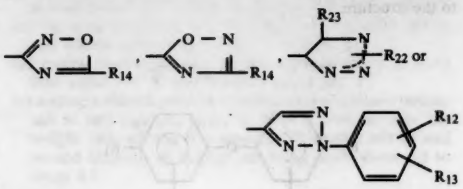
and


(8)

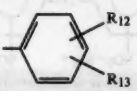
in which n denotes 0 or 1, X denotes an oxygen or sulfur atom, R_1 and R_2 denotes identical or different radicals from the group comprising hydrogen, fluorine or chlorine atoms, phenyl, trifluoromethyl, C_1–C_9 alkyl, alkoxy, dialkylamino, acylamino, cyano, carboxyl, carbalkoxy, carboxamide, sulfonic acid, sulfonamide or sulfonic acid alkyl ester, it being possible for two adjacent radicals R_1 and R_2 together also to represent a benzo ring, a lower alkylene group or a 1,3-dioxapropylene group, B denotes cyano or a group of the formula —$COOR_{11}$ or $CONR_{11}R_{11}$, in which R_{11} denotes hydrogen, C_1–C_{18} alkyl, cycloalkyl, aryl, alkylaryl, halogenoaryl, aralkyl, alkoxyalkyl, halogenoalkyl, hydroxyalkyl, alkylaminoalkyl, carboxyalkyl or carboalkoxyalkyl, or two alkyl or alkylene radicals with the meaning of R_{11} can also form, together with the nitrogen atom, a morpholine, piperidine or piperazine ring, or B denotes a group of the formula



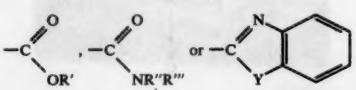
in which R_{12} and R_{13} denote identical or different radicals from the group comprising hydrogen, fluorine or chlorine atoms, phenyl, alkyl, alkoxy, acylamino, cyano, carboxyl, carbalkoxy, carboxamide, sulfonic acid, sulfonamide or sulfonic acid alkyl ester and two adjacent radicals R_{12} and R_{13} together can also represent an alkylene group, a fused benzo ring or a 1,3-dioxapropylene group, or B denotes a group of the formulae



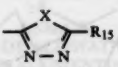
in which R_{14} denotes a straight-chain or branched alkyl group having 1–18 C atoms and preferably 1–6 C atoms, which can be substituted by hydroxyl groups, halogen atoms or alkoxy, dialkylamino, alkylmercapto, chloroaryloxy, aryloxy, arylmercapto or aryl radicals, it being possible, in the case of the dialkylaminoalkyl groups, for the two alkyl groups together also to form a morpholine, piperidine or piperazine ring, or R_{14} denotes a group of the formula —$(CH_2CH_2O)_n$—R in which n is 1, 2 or 3 and R is H, alkyl, dialkylaminoalkoxyalkyl or alkylthioalkoxyalkyl, it being possible for the dialkyl groups in dialkylaminoalkoxyalkyl together to form a piperidine, pyrrolidine, hexamethyleneimine, morpholine or piperazine ring, or R_{14} denotes a radical of the formula



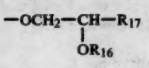
R_{22} denotes a hydrogen atom, a triphenylmethyl group or a lower alkyl radical, which is optionally substituted by a lower carbalkoxy, carboxamide, mono- or di-alkylcarboxamido, carboxyl or benzoyl group, and R_{23} denotes a cyano group or a group of the formulae



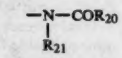
in which R′, R″ and R‴ denotes a hydrogen atom, a lower alkyl radical or a phenyl radical, and it being possible for the lower alkyl radicals to be substituted by hydroxyl, lower alkoxy, lower dialkylamino or lower trialkylammonium groups and for the phenyl group to be substituted by halogen atoms or lower alkyl or lower alkoxy groups, and in which R″ and R‴ together can also form a saturated, divalent radical, and Y denotes O, S or N—R, in which R is H or (C_1 to C_4)-alkyl, or B denotes a group of the formula



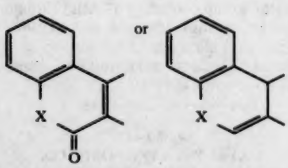
in which R_{15} denotes a phenyl ring which can be substituted by one or two chlorine atoms, one or two alkyl or alkoxyalkyl groups or one phenyl, cyano, carboxyl, carbalkoxy, carboxamide, sulfonic acid, sulfonamide or sulfonic acid alkyl ester group, R_3 and R_4 can be identical or different and denote hydrogen, alkyl, cycloalkyl, alkoxy, hydroxyalkoxyethyl, halogenoalkyl, aralkyl, aryl or N,N-dialkylamine, or RO_3 and R_4 together form a five-membered heterocyclic radical having 1 to 3 heteroatoms, preferably N atoms, R_5 denotes straight-chain or branched alkyl, alkoxyalkyl, dialkylaminoalkyl or a radical of the formula



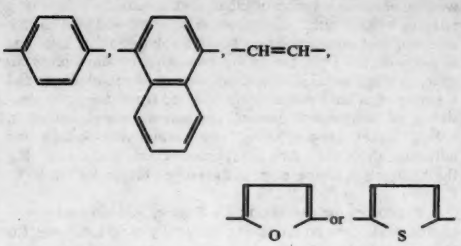
in which R_{16} is hydrogen, C_2–C_8-alkanoyl, benzoyl or a radical of the formula $R_{18}NHCO$— or $R_{19}OCO$— and R_{17} is hydrogen, alkyl or phenyl, R_{18} is alkyl, phenyl, halogenophenyl or tolyl and R_{19} is C_1–C_8-alkyl, alkoxyalkyl, cyclohexyl, benzyl, phenylethyl or phenyl which is optionally substituted by non-chromophoric substituents, or R_5 denotes a radical of the formula



in which R_{20} is C_1–C_{10}-alkyl, C_2–C_6-alkenyl, C_2–C_6-alkinyl, C_1–C_8-alkoxy, C_1–C_8-alkylamino or dialkylamino, phenoxymethyl, phenyl, tolyl, benzyl or phenylethyl and R_{21} is C_3–C_{10}-alkyl, which can be substituted by phenyl, hydroxyphenyl, methoxy or dimethoxy, R_6 denotes an aryl radical, which is optionally substituted by non-chromophoric substituents, or denotes a 1,2,4-triazol-1-yl-phenyl, 1,2,3-triazol-4-yl-phenyl, 1,2,3-triazol-3-yl-phenyl or 1,2,3-triazol-2-yl-phenyl radical, which optionally can be substituted by 1 or 2 C_1–C_3-alkyl or oxalkyl groups or by oxaryl, oxalkenyl or oxalkanoyl, or R_6 denotes a heterocyclic ring having 1–3 heteroatoms, preferably N or O, which can be substituted by alkyl, alkoxy, halogen, aryl or halogenoaryl, or R_6 denotes a 1-oxa-2,4-diazol-5-yl radical, which can be substituted by benzyl, alkoxyphenyl, styryl, halogen, alkoxy or a further heterocyclic group, or R_6 denotes a benzimidazol-1-yl, benzimidazol-2-yl, benzthiazol-1-yl or benzthiazol-2-yl radical, which can be substituted by non-chromophoric substituents, R_7 denotes hydrogen, alkyl, alkoxy, aryl or a five-membered heterocyclic radical which has 1–3 N or O hetero-atoms and is bonded via a nitrogen atom and can be substituted by alkyl, aryl, hydroxyl, oxalkyl, oxalkenyl, oxaryl, oxarylalkyl, oxalkoxycarbonyl, oxcarbamoyl, oxepoxyalkyl, styryl or halogenostyryl, a fused phenyl, naphthyl or phenanthryl ring or a fused group of the formulae



and the aromatic rings in the fused groups can also be substituted by alkyl or alkoxy and X is oxygen, NH or N-alkyl, R_8 represents a polycyclic, aromatic radical having at least three fused rings, which optionally carry non-chromophoric substituents, R_9 represents an amino group, which is substituted by one or two alkyl, hydroxyalkyl, acyl or phenyl groups, it being possible for the phenyl group to contain one or more non-chromophoric radicals and for two alkyl groups, together with the nitrogen atom of the amino group, to form a pyrrolidine or piperidine ring or, with the inclusion of a further nitrogen or oxygen atom, a piperazine or morpholine ring, or R_9 represents an alkoxy, hydroxyalkoxy, acyloxy, alkylthio or carbalkylmercapto group, R_{10} independently of R_8 has the meaning as R_9 and in addition can denote a chlorine atom and V denotes a group of the formulae

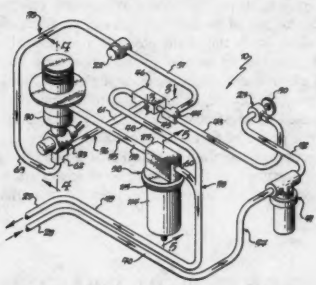


4,330,428

SMOKE GENERATOR

Earl W. Clifford, Getzville, N.Y., assignor to The Aro Corporation, Bryan, Ohio

Filed Jun. 1, 1981, Ser. No. 268,802
Int. Cl.³ B01F *3/02*; B01J *7/00*; G01M *3/04*
U.S. Cl. 252—359 CG **11 Claims**



1. A smoke generator having an inlet adapted to be supplied with a flow of fluid and having an outlet, and being adapted to provide a flow of smoke-entrained fluid through said outlet, said smoke generator comprising:

means forming a chamber;

a fuel arranged in said chamber;

a heater arranged to contact said fuel and selectively operable to heat said fuel and generate smoke therefrom;

a first conduit establishing a flow of said fluid from said inlet to said outlet;

a second conduit communicating said chamber with said first conduit; and

means for causing smoke in said chamber to be entrained into the fluid flowing through said first conduit.

4,330,429

PROCESS FOR REGENERATING AN ANTIMONY CONTAINING OXIDE CATALYST

Yutaka Sasaki; Hiroshi Utsumi; Akimitsu Morii, all of Yokohama, and Yoshimi Nakamura, Kawasaki, all of Japan, assignors to Nitto Chemical Industry Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 959,810, Nov. 13, 1978, abandoned. This application Nov. 3, 1980, Ser. No. 203,754
Claims priority, application Japan, Nov. 12, 1977, 52/135235
Int. Cl.³ B01J *23/92*; C07C *120/14*, *5/48*, *11/12*
U.S. Cl. 252—413 **4 Claims**

1. The process for regenerating a deteriorated antimony containing oxide catalyst consisting essentially of (i) antimony and (ii) at least one metal element selected from the group consisting of iron, cobalt, nickel, manganese, uranium, cerium, tin and copper which consists essentially of the steps of im-

pregnating or spraying said antimony containing oxide catalyst with an aqueous solution of nitric acid, a nitrate solution or a mixture of said nitric acid aqueous solution and said nitrate solution, said nitrate solution being a solution of at least one nitrate selected from the group consisting of ammonium nitrate, an alkali metal nitrate, an alkaline earth metal nitrate and a nitrate of at least one element selected from the group consisting of lanthanum, cerium, chromium, manganese, iron, cobalt, nickel, copper, silver, zinc, aluminum, bismuth and tellurium, drying the thus impregnated catalyst, and calcining the catalyst at a temperature in the range of from 400° to 1000° C.

2. A process for regenerating a deteriorated antimony containing oxide catalyst consisting essentially of (i) antimony, (ii) at least one metal element selected from the group consisting of iron, cobalt, nickel, manganese, uranium, cerium, tin and copper, and (iii) at least one element selected from the group consisting of magnesium, calcium, strontium, barium, lanthanum, titanium, zirconium, vanadium, niobium, tantalum, chromium, molybdenum, tungsten, zinc, cadmium, boron, aluminum, gallium, germanium, lead, phosphorus, bismuth and tellurium which consists essentially of the steps of impregnating or spraying said antimony containing oxide catalyst with an aqueous solution of nitric acid, a nitrate solution or a mixture of said nitric acid solution and said nitrate solution, said nitrate solution being a solution of at least one nitrate selected from the group consisting of ammonium nitrate, an alkali metal nitrate, and alkaline earth metal nitrate and a nitrate of at least one element selected from the group consisting of lanthanum, cerium, chromium, manganese, iron, cobalt, nickel, copper, silver, zinc, aluminum, bismuth and tellurium, drying the thus impregnated catalyst, and calcining the catalyst at a temperature in the range of from 400° to 1000° C.

3. A process according to claim 1 or 2 wherein said calcination temperature is in the vicinity of or lower than the final or highest calcination temperature used in manufacturing the catalyst.

4,330,430

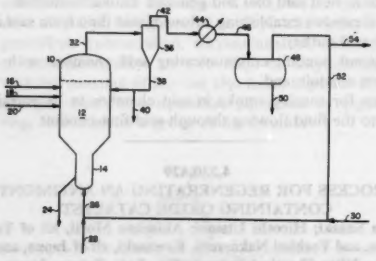
METHOD FOR PRODUCING AND REGENERATING A SYNTHETIC CO_2 ACCEPTOR

Michael S. Lancet; George P. Curran, both of Pittsburgh, Pa., and Everett Gorin, San Rafael, Calif., assignors to Conoco Inc., Stamford, Conn.

Continuation-in-part of Ser. No. 20,004, Mar. 12, 1979, abandoned. This application Jun. 27, 1980, Ser. No. 163,558

Int. Cl.³ B01J *20/34, 20/04;* L01J *3/12*

U.S. Cl. 252—420 **8 Claims**



1. A method for producing regenerable synthetic discrete CO_2 acceptor pellets for use as fluidized bed CO_2 acceptor material, said acceptor comprising a thermally stable inert support matrix and at least one calcium compound selected from the group consisting of calcium oxide and calcium carbonate, said thermally stable inert support matrix providing support for said calcium compound such that when said calcium compound is molten, said molten calcium compound is held within said thermally stable inert support matrix thereby permitting repeated melting and hardening of said calcium compound without agglomeration of said fluidized bed of said regenerable synthetic discrete CO_2 acceptor pellets said method comprising

(a) feeding to a fluidized bed finely divided silica and a finely divided calcium compound selected from the group consisting of calcium oxide and calcium carbonate in an amount from about 20 to about 35 weight percent, based on calcium carbonate equivalent, in excess of the amount of calcium compound required to react with said silica to produce said regenerable synthetic discrete CO_2 acceptor pellets;

(b) operating said fluidized bed at a total pressure from about 15 to about 25 atmospheres, a temperature from about 1200° to about 1600° F., a CO_2 partial pressure from about 1 to about 5 atmospheres and a steam partial pressure from about 14 to about 20 atmospheres to form said regenerable synthetic discrete CO_2 acceptor pellets.

4. The method of claim 1 further comprising contacting said CO_2 acceptor pellets with CO_2 to form spent CO_2 acceptor pellets;

regenerating said spent CO_2 acceptor pellets in a fluidized bed at a total pressure from about 15 to about 25 atmospheres, a temperature from about 1200° to about 1600° F., a CO_2 partial pressure from about 1 to about 5 atmospheres and a steam partial pressure from about 14 to about 20 atmospheres to form regenerated CO_2 acceptor pellets.

5. The method of claim 4 wherein said regenerated synthetic CO_2 acceptor has a CO_2 absorption capcity of about 12 to about 20 grams of CO_2 per 100 grams of calcined synthetic CO_2 acceptor.

4,330,431

CATALYST SYSTEM

Nikolaous K. Balint, Naperville, Ill., assignor to Standard Oil Company (Indiana), Chicago, Ill.

Continuation of Ser. No. 947,119, Sep. 29, 1978, abandoned. This application Mar. 6, 1980, Ser. No. 127,867

Int. Cl.³ C08F *4/64*

U.S. Cl. 252—429 B **8 Claims**

1. A process for forming a catalyst composition for the polymerization of propylene or mixtures of propylene and copolymerizable alpha-olefins, which produces low amounts of n-hexane-soluble polymer, comprising mixing in a suitable medium a titanium trihalide; an organoaluminum compound selected from the group consisting of dialkyl aluminum halide, trialkyl aluminum, mixtures thereof, and mixtures of trialkyl aluminum with alkyl aluminum dihalide; and an aqueous hydrohalic mineral acid in a molar ratio to organoaluminum compound up to about 0.25 to 1.

4,330,432

CATALYST COMPOSITION

David L. Beach, Gibsonia; Richard W. Lunden, Pittsburgh, both of Pa., and Adolfo Zambelli, Milan, Italy, assignors to Gulf Research & Development Company, Pittsburgh, Pa.

Filed Dec. 29, 1980, Ser. No. 220,313

Int. Cl.³ C08F *4/64*

U.S. Cl. 252—429 C **32 Claims**

1. A novel catalyst composition comprising (A) the solid reaction product of (1) at least one non-halide-containing organic oxygenated compound of magnesium selected from the group consisting of magnesium alkoxides, magnesium phenates, magnesium salts of carboxylic acids and magnesium chelates, (2) at least one non-halide-containing organic oxygenated titanium compound selected from the group consisting of titanium alkoxides, titanium phenates and titanium chelates and (3) an aluminum halide; (B) an activator selected from the group consisting of aluminum hydrocarbyls and magnesium hydrocarbyls; and (C) at least one non-halide-containing organic oxygenated titanium compound, selected from the group

consisting of titanium alkoxides, titanium phenates and titanium chelates, wherein the molar ratio of the non-halide containing organic oxygenated titanium compound of Component (C) to the non-halide containing organic oxygenated titanium compound used to prepare the solid reaction product is in the range of about 10:1 to about 500:1.

4,330,433

TITANIUM TRIHALIDE CATALYST AND PROCESS FOR ITS PRODUCTION

Harry J. Wristers, deceased, late of Baytown, Tex. (by Joy K. Wristers, executrix), assignor to Exxon Research & Engineering Co., Florham Park, N.J.

Continuation-in-part of Ser. No. 125,400, Feb. 27, 1980, abandoned. This application Jan. 15, 1981, Ser. No. 225,213

Int. Cl.[3] C08F *4/64*

U.S. Cl. 252—429 B 68 Claims

1. A process for producing titanium trihalide solids product having an average particle size diameter greater than 35 microns and a narrow particle size distribution comprising:

(a) adding an organometallic reducing compound with stirring to a solution of titanium tetrahalide in a suitable diluent at a temperature of about −50° C. to about +10° C., in a mole ratio of between about 1:3 to about 1.2:1 and at a rate such that the reduction of titanium tetrahalide to titanium trihalide is about 0.03 to about 0.2 m moles per liter per second to obtain titanium trihalide solids product in the diluent having a narrow particle size distribution and an average particle size greater than about 20 microns;

(b) continuously and simultaneously adding with stirring to the titanium trihalide solids product in the diluent an organometallic reducing compound and titanium tetrahalide in a mole ratio of about 1:3 to about 1.2:1, the simultaneous addition being made at a rate such that the reduction of titanium tetrahalide to titanium trihalide is about 6×10^{-4} to about 0.02 m moles per liter per second per m^2 of available preformed titanium trihalide surface area until solids product of desired size are obtained, and

(c) recovering titanium trihalide solids product.

4,330,434

SUPPORTED ACIDIC CATALYST

O. Richard Hughes, Chatham, N.J., assignor to Celanese Corporation, New York, N.Y.

Division of Ser. No. 119,682, Feb. 8, 1980, Pat. No. 4,293,499. This application Apr. 2, 1981, Ser. No. 250,191

Int. Cl.[3] B01J *31/02*

U.S. Cl. 252—430 4 Claims

1. A strongly acidic solid catalyst composition comprising a composite of between about 0.5–40 weight percent, based on catalyst weight, of 5-sulfoisophthalic acid in combination with a carrier substrate having a surface area between about 1–1000 m^2/gram.

4,330,435

CATALYST FOR THE DISPROPORTIONATION OF PETROLEUM HYDROCARBONS

Ralph J. Bertolacini, Chesterton, Ind.; Dae K. Kim, Naperville, Ill., and Gerald M. Lehmann, Gary, Ind., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Division of Ser. No. 849,605, Nov. 8, 1977, Pat. No. 4,167,530. This application Jan. 8, 1979, Ser. No. 1,952

Int. Cl.[3] B01J *29/26*

U.S. Cl. 252—455 Z 7 Claims

1. A catalytic composition for disproportionation of petroleum hydrocarbons consisting essentially of a tungsten/molybdenum component deposited upon an acidic cracking component consisting essentially of a mordenite large pore crystalline aluminosilicate material and a refractory inorganic oxide consisting essentially of a catalytically active alumina selected from the group consisting of gamma-alumina and eta-alumina, wherein said mordenite large pore crystalline aluminosilicate material of said acidic cracking component is suspended in and dispersed throughout a matrix of said inorganic oxide.

2. The composition of claim 1 wherein the said tungsten/-molybdenum component comprises tungsten in an amount within the range of about 1 weight percent to about 10 weight percent, expressed as WO_3 and based upon the total weight of said catalytic composition, and molybdenum in an amount within the range of about 1 weight percent to about 20 weight percent expressed as MoO_3 and based upon the total weight of said catalytic composition.

4,330,436

CATALYST SUPPORTS AND FLUID TREATMENT DEVICES

James A. Cairns, Wantage; John E. Antill, Harwell, and Michael L. Noakes, Reading, all of England, assignors to United Kingdom Atomic Energy Authority, London, England

Continuation of Ser. No. 916,829, Jun. 19, 1978, abandoned. This application Aug. 20, 1980, Ser. No. 179,825

Claims priority, application United Kingdom, Jun. 20, 1977, 25747/77

Int. Cl.[3] B01J *21/04, 23/74, 35/02*

U.S. Cl. 252—466 J 4 Claims

1. A method of manufacturing a device for the catalytic purification of exhaust gases of an internal combustion engine, which method comprises forming short lengths of wire of an aluminium containing, iron based alloy with a smooth surface free between its ends from edges or sharp corners, corrugating the short lengths of wire into a smooth curved corrugated form and then winding the short lengths of wire into short helical coil components whereby the space between adjacent turns of the helical coil components varies as a consequence of the corrugation, the peaks of the corrugation in each turn being arranged to coincide with peaks in the next adjacent turn to serve to prevent nesting of adjacent helical coil components, and contacts between adjacent turns of the wire in the helical coil being avoided, contacting the components with a dispersion in a liquid medium of a refractory material and separately or simultaneously contacting the components with a dispersion in a liquid medium of catalytic material or material convertible into a catalytic material, the components being shaken after contact with said liquid dispersion to remove excess liquid, followed by drying and firing, and assembling the components in a container having inlet and outlet gas passageways.

4,330,437

SUPPORTED SILVER CATALYST AND A PROCESS OF PREPARING IT

Bruno O. Krueger, Springfield, Oreg., assignor to Borden, Inc., Columbus, Ohio

Filed Nov. 5, 1980, Ser. No. 204,153

Int. Cl.[3] B01J *23/50*

U.S. Cl. 252—476 11 Claims

1. A process of preparing a supported silver catalyst which comprises:

(a) contacting an inert porous carrier with water to wet the surface of said carrier;

(b) contacting the wet carrier with an ammoniated aqueous solution of a silver salt;

(c) drying the silver solution on the carrier; and

(d) heating the dried carrier at a temperature sufficient to decompose silver compounds on the carrier to metallic silver.

4,330,438

POWDERED SHAMPOO CONCENTRATE

David Dierassi, West Orange, and David Murray, Bloomfield, both of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Dec. 29, 1980, Ser. No. 220,587
Int. Cl.³ C11D 17/06, 1/14
U.S. Cl. 252—552 8 Claims

1. A powder shampoo concentrate comprising:
(a) from about 50 to 75 parts by weight of an alkali metal or ammonium salt of an alpha olefin sulfonate having from 12 to 18 carbon atoms, and
(b) from about 18 to 30 parts by weight of a nonionic hydroxypropyl polygalactomannan derivative with 0.35 to 0.60 moles of substitution.

4,330,439

ELECTRIC DEVICE COMPRISING IMPREGNATED INSULATING MATERIALS AND ELECTRIC ELEMENTS

Mineaki Nishimatsu, Kyoto; Sadayoshi Mukai, Katano; Yoshinori Hayashi, Ohtsu; Osamu Yamaguchi, Takatsuki; Akira Ito, and Nobuo Ahiko, both of Iwaki, all of Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo and Nissin Electric Co., Ltd., Kyoto, both of, Japan

Filed Oct. 29, 1980, Ser. No. 201,930
Claims priority, application Japan, Nov. 8, 1979, 54-145125; Nov. 8, 1979, 54-145126
Int. Cl.³ H01F 27/10
U.S. Cl. 252—570 10 Claims

1. An oil-impregnated electric device containing as its component an electric element selected from the group consisting of capacitors, cables, and transformers comprising a film of synthetic resin selected from the group consisting of polyolefins, polyesters, and polyvinylidene fluoride, wherein said electric element comprising a synthetic resin film is impregnated with an insulating oil selected from 1-phenyl-2-ethylphenylethane, 1-phenyl-2-isopropylphenylethane and mixtures thereof.

4,330,440

ACTIVATED MATRIX AND METHOD OF ACTIVATION

John S. Ayers; Geoffrey S. Bethell; William S. Hancock, all of Palmerston North, and Milton T. W. Hearn, Dunedin North, all of New Zealand, assignors to Development Finance Corporation of New Zealand, Wellington, New Zealand

Continuation-in-part of Ser. No. 874,628, Feb. 2, 1978, Pat. No. 4,224,439. This application Mar. 10, 1980, Ser. No. 128,847
The portion of the term of this patent subsequent to Sep. 23, 1997, has been disclaimed.
Int. Cl.³ C08L 1/00
U.S. Cl. 525—54.31 15 Claims

1. A compound of the general formula III

$$\text{MATRIX}-\text{O}-\overset{\overset{\text{O}}{\|}}{\text{C}}-\text{Y} \qquad \text{III}$$

wherein MATRIX is a water and organic insoluble radical selected from the group consisting of:
cross-linked polysaccharides, substituted by C_2–C_8 alkyl or alkenyl groups, macroporous synthetic polymers, co-polymers of cross-linked substituted polysaccharides with macroporous synthetic polymers, cross-linked co-polymers of unsubstituted polysaccharides with macroporous synthetic polymers, and rigid supports with pendant hydroxyalkyl groups, and Y is a member selected from the group consisting of:
imidazolyl; 1,2,4-triazolyl; and 1,2,3-benzotriazolyl.

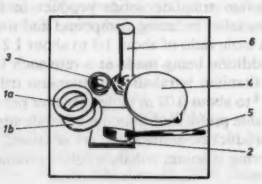
4. The compound as claimed in claim 1 wherein said MATRIX is a copolymer of polyacrylamide with a cross-linked substituted or unsubstituted polysaccharide selected from the group consisting of: agarose, starch, dextran, cellulose, regenerated cellulose, hydroxy C_2–C_4 alkylated cellulose and hydroxy C_2–C_4 alkylated regenerated cellulose.

4,330,441

SOLVENT-SOLUBLE SUBSTANCES CHARACTERIZED IN THAT WATER-SOLUBLE CELLULOSE ETHERS ARE CHEMICALLY BONDED TO WATER-SOLUBLE, AT LEAST PREDOMINATELY SYNTHETIC POLYMERS CONTAINING ACRYLIC UNITS

Branislaw Böhmer; Lutz Hoppe; Klaus Szablikowski; Dieter Kudora, and Rudolf Behn, all of Walsrode, Fed. Rep. of Germany, assignors to Wolff Walsrode Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Dec. 26, 1979, Ser. No. 107,094
Claims priority, application Fed. Rep. of Germany, Jan. 3, 1979, 2900110
Int. Cl.³ C08B 37/00; C04B 7/352, 7/354, 11/22
U.S. Cl. 525—54.23 13 Claims



1. A water-soluble macromolecular substance having a high capacity for dispersion, suspension and water-retention, said macromolecular substance consisting of a water-soluble cellulose ether joined via an at least bi-functional cross-linking agent to a water-soluble polymer component containing synthetic acrylic units or to said water-soluble polymer component containing synthetic acrylic units in admixture with a polymer of sodium alginate, of ethylene glycol, of propylene glycol, of vinyl alcohol or of an amide, said at least bifunctional cross-linking agent being selected from the group consisting of epichlorohydrin, glyoxal, glycidyl, paraformaldehyde, glutaric dialdehyde, maleic acid anhydride, epichlorohydrin polydiol, glycidyl methacrylate, N-methylol-acrylamide, ethylene glycol dimethacrylate, tetraallyloxyethane, tetraallyloxymethane, glyoxal-bis-acrylamide, bis-acrylamidoacetic acid, acrylamidoglycollic acid and reaction products of epichlorohydrin and bis-phenol-A.

8. A water-soluble macromolecular substance of claim 1 wherein the water-soluble cellulose ether is selected from the group consisting of methyl cellulose, hydroxyethyl cellulose, hydroxypropyl methyl cellulose and carboxymethyl cellulose and the water-soluble polymer component containing synthetic acrylic units is a substance comprising structural units selected from the group consisting of homopolymers and copolymers of acrylamide, acrylamide derivatives, acrylic acid, methacrylic acid, 2-acrylamido-2-methylpropane-sulphonic acid, vinyl caprolactam, vinylpyrrolidone, acrylic acid esters, methacrylic acid esters, acrylonitrile, partly hydrolyzed acrylonitrile, acrylonitrile drivatives, graft copolymers of acrylamide on methyl cellulose and graft polymers of acrylamide and acrylic acid on methyl cellulose.

4,330,442

ASBESTOS FREE GASKET FORMING COMPOSITIONS

Charles M. Lindeman, and Ralph D. Andrew, both of Lancaster, Pa., assignors to Armstrong World Industries, Inc., Lancaster, Pa.

Filed May 7, 1980, Ser. No. 148,669
Int. Cl.³ C08K 7/08, 7/10, 7/04, 7/02
U.S. Cl. 524—16 15 Claims

1. An asbestos-free gasket forming composition in weight parts per 100 parts of the total fiber and filler weight about 3 to 60 parts phenolic fibers having lengths of within about 1 mm to about 15 mm: about 5 to 50 parts aramid fibers; about 10 to 80 parts of at least one inorganic filler or cork filler; and 10 to 40 parts add-on of a synthetic rubber binder.

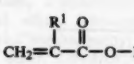
4,330,443

DRY CHEMICAL PROCESS FOR GRAFTING ACRYLIC AND METHYL ACRYLIC ESTER AND AMIDE MONOMERS ONTO STARCH-CONTAINING MATERIALS

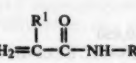
John C. Rankin, Peoria, Ill., assignor to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Jun. 18, 1980, Ser. No. 160,752
Int. Cl.³ C08L 3/04
U.S. Cl. 527—312 10 Claims

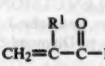
1. In a method for preparing a graft copolymer of a starch-containing material and an acrylic monomer selected from the group consisting of compounds having the following structural formulas:



(1)



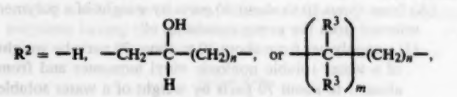
(2) and



(3)

wherein

R^1=—H, or is from the group of C_1–C_6 straight, branched, or cyclic alkyl radicals;



with the proviso that if R^2 is —H, then the functional group A is eliminated;

wherein each R^3 is independently selected from the group of —H, and C_1–C_6 straight or branched alkyl radicals, and wherein two R^3 substituents may be joined together to form a cyclic structure; and wherein

m=0, 1 and

n=1–6;

A=a cationic, anionic, or nonionic functional group; and

B=—N⊖-amine⊕ or —⊕NH-amine-halogen⊖;

the improvement comprising reacting said starch-containing material with said monomer in a dry state and in the presence of a peroxide in a non-redox catalysis system.

4,330,444

SIZING COMPOSITION AND SIZED FIBERS WITH INCREASED HARDNESS

Gary A. Pollman, Sylvania, Ohio, assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Sep. 4, 1979, Ser. No. 72,711
Int. Cl.³ C08L 91/00, 63/02
U.S. Cl. 523—404 13 Claims

1. An aqueous sizing composition for glass fibers to produce treated glass fibers having increased hardness and improved integrity with good flow-through and wet-out properties, comprising in weight percent of the aqueous sizing composition:

a. about 3 to about 20 weight percent of a substantially noncrystalline liquid epoxy resin in an aqueous dispersion wherein the epoxy resin is in the dispersion in an amount of 50 to 60 percent by weight of the nonvolatiles and has a weight per epoxide of around 500 to 550 and where the dispersion has an average particle size between 1 and 4 microns,

b. about 3 to about 15 weight percent of melamine formaldehyde condensate,

c. about 1 to about 8 weight percent of a polyamide resin wherein the ratio of amounts of melamine formaldehyde condensate to polyamide resin is in the range of about 2 to about 20 moles of melamine formaldehyde condensate to one mole of polyamide resin and wherein the polyamide resin is reactive with the melamine formaldehyde condensate to form a reaction product;

d. about 0.1 to about 2 weight percent of one or more silane coupling agents,

e. about 1 to about 12 weight percent of a thermoplastic plasticizing agent selected from the group consisting of vinyl acrylic copolymer and epoxy resin blend, polyurethane, a reaction product of a partial ester of a carboxylic acid and polyepoxy compound, silane polyvinyl acetate copolymer, and plasticized polyvinyl acetate and polyvinylacetate, and

f. water in the remaining amount of the composition.

4,330,445

CHINAWOOD OIL-PHENOLIC RESIN CONDENSATES

James J. Killeen, Mundelein; Thomas H. Plaisance, Wilmette, and Kazys Sekmakas, Palatine, all of Ill., assignors to De Soto, Inc., Des Plaines, Ill.

Filed Oct. 15, 1980, Ser. No. 197,280
Int. Cl.³ C08G 63/48
U.S. Cl. 525—501.5 6 Claims

1. A chinawood oil-phenolic resin condensate produced by heat reacting; (1) an o-cresol-formaldehyde condensate containing about 1 to about 2 mols of formaldehyde per mol of o-cresol; with (2) from about 80% to about 95% of its weight of chinawood oil; and (3) from 2% to 10% of the total weight of an alkyd resin which is a condensate of a polyethylenically unsaturated monocarboxylic fatty acid containing from 16–22 carbon atoms with about 0.5 mol per mol of said acid of an aliphatic glycol having a molecular weight of less than about 200, said components being heat reacted to a viscosity measured at 25° C. of at least about Z on the Gardner-Holdt scale in 80% solution in n-butanol.

4,330,446

AQUEOUS DISPERSION FOR METAL COATING FROM COLLOIDAL SILICA, ALKOXY SILANE, AND POLYMER

Yoshiaki Miyosawa, Hiratsuka, Japan, assignor to Kansai Paint Co., Ltd., Japan

Continuation of Ser. No. 816,969, Jul. 19, 1977, abandoned. This application May 17, 1979, Ser. No. 39,954

Claims priority, application Japan, Jul. 20, 1976, 51-86167; Jan. 25, 1977, 52-7107; Mar. 31, 1977, 52-36545; Apr. 4, 1977, 52-38354

Int. Cl.[3] C08K *3/36, 5/54*

U.S. Cl. 523—409 8 Claims

1. A composition for surface treatment of metals which comprises an aqueous dispersion of a silica-organic polymer complex which is the reaction product of ingredients consisting essentially of colloidal silica wherein the silica is of 7 to 100 mμ particle size, water soluble or water dispersible organic polymer having both hydroxyl and carboxyl groups and an acid value of 20–200 selected from the group consisting of acrylic copolymer resin, alkyd resin, epoxyester resin and polybutadiene resin, the compounding ratio on a solids basis of said colloidal silica and said organic polymer being in the range of 5:95 to 95:5 by weight, and 0.5–15% by weight based on the solid weight of said colloidal silica and said organic polymer of silane compound selected from the group consisting of divinyl dimethoxy silane, divinyl di-β-methoxyethoxy silane, di(γ-glycidoxy propyl)dimethoxy silane, vinyl triethoxy silane, vinyl tris-β-methoxyethoxy silane, γ-glycidoxy propyl trimethoxy silane, γ-methacryloxypropyl trimethoxy silane, β-(3,4-epoxycyclohexyl)ethyl trimethoxy silane, N-β-aminoethyl-γ-propylmethyl dimethoxy silane, N-β-aminoethyl-γ-propyl trimethoxy silane, and γ-aminopropyl triethoxy silane.

4,330,447

THERMOPLASTIC ELASTOMERIC COMPOSITIONS HAVING IMPROVED FLOW

Robert D. Lundberg, Bridgewater; Robert R. Phillips, Spring Lake Heights, and Ilan Duvdevani, Leonia, all of N.J., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Jan. 5, 1981, Ser. No. 222,484

Int. Cl.[3] C08L *91/00*

U.S. Cl. 524—269 13 Claims

1. A thermoplastic elastomeric composition having improved flow comprising:

(a) a neutralized sulfonated polymer; derived from an elastomeric polymer selected from the group consisting of EPDM terpolymers and Butyl Rubber;

(b) about 1 to about 15 parts by weight of preferential plasticizer selected from the group consisting of carboxylic acids having about 5 to about 30 carbon atoms and metallic salts of said carboxylic acids;

(c) about 0.1 to about 30 parts by weight of polydimethylsiloxane per 100 parts by weight of the neutralized sulfonated polymer.

4,330,448

PROCESS FOR PRODUCING CYCLOPENTADIENE RESIN

Riso Iwata, Tokyo, Japan, assignor to Nippon Zeon Co., Ltd., Tokyo, Japan

Filed Sep. 17, 1980, Ser. No. 188,106

Claims priority, application Japan, Sep. 26, 1979, 54-123611

Int. Cl.[3] C08F *2/02, 2/06*

U.S. Cl. 526—79 15 Claims

1. In a process for producing a cyclopentadiene resin having a regulated softening point which comprises heat-copolymerizing a cyclopentadiene monomer and a comonomer copolymerizable therewith, the improvement which comprises polymerizing (A) a monomeric mixture of a cyclopentadiene monomer for about 0.5 to about 6 hours at a temperature of about 230° C. to about 300° C., then adding (B) a cyclopentadiene monomer or (C) a monomeric mixture of a cyclopentadiene monomer, wherein the content of the cyclopentadiene monomer in the monomeric mixture (A) is at least 10% by weight lower than that of the monomer (B) or the cyclopentadiene monomer of the monomeric mixture (C), and continuing the polymerization of an additional 0.5 to 6 hours at a temperature of about 230° C. to about 300° C., to obtain said cyclopentadiene resin.

4,330,449

PROCESS FOR PREPARATION OF COMPOSITIONS OF BITUMEN POLYMERS AND PRODUCTS

Paul Maldonado, St Symphorien d'Ozon; Daniele Eber, Lyons, and Trung Kiet Phung, Vienne, all of France, assignors to Elf France, Paris, France

Continuation-in-part of Ser. No. 94,362, Nov. 15, 1979, abandoned. This application Jun. 29, 1981, Ser. No. 278,606

Int. Cl.[3] C08L *95/00*

U.S. Cl. 524—68 4 Claims

1. A method of preparing a polymer-asphalt composition which comprises forming a mixture at a temperature of 130 to 230° C., comprising 80 to 98% by weight of an asphalt having a penetration between 30 and 220, and 2 to 20% by weight of a polyblock styrene-carboxylated conjugated diene copolymer having a molecular weight between 30,000 and 300,000, maintaining the mixture for at least two hours at a temperature of 130 to 230° C., then adding to said mixture 0.1 to 3by weight of elemental sulfur, based on the asphalt in said mixture, while agitating the mixture and maintaining the temperature of 130 to 230° C. for at least 20 minutes to form said composition, the conjugated diene block being selected from the group consisting of carboxylated butadiene and carboxylated isoprene.

4,330,450

AMPHOTERIC WATER-IN-OIL SELF-INVERTING POLYMER EMULSION

Stanley A. Lipowski, Livingston, and John J. Miskel, Jr., Mendham, both of N.J., assignors to Diamond Shamrock Corporation, Dallas, Tex.

Filed Oct. 15, 1979, Ser. No. 84,986

Int. Cl.[3] C08L *27/06, 29/02, 31/02, 39/08*

U.S. Cl. 524—547 9 Claims

1. An amphoteric water-in-oil self-inverting polymer emulsion comprising

(A) from about 10 to about 50 parts by weight of a polymer selected from the group consisting of

(1) a copolymer from about 30 to about 99 parts by weight of a water soluble nonionic vinyl monomer and from about 1 to about 70 parts by weight of a water soluble amphoteric vinyl monomer, and

(2) a terpolymer from about 30 to 98 parts by weight of a water soluble nonionic vinyl monomer, from about 1 to about 35 parts by weight of a water soluble anionic vinyl monomer and from about 1 to about 35 parts by weight of a water soluble cationic vinyl monomer,

(B) from about 10 to about 50 parts by weight of water,

(C) from about 5 to about 50 parts by weight of a hydrophobic liquid,

(D) from about 2 to about 25 parts by weight of a water-in-oil emulsifying agent, and

(E) from about 1 to about 15 parts by weight of an inverting surfactant

wherein the polymer is in the aqueous phase.

4,330,451

PREPARATION OF A POLYVINYLPYRROLIDONE BY HEAT TREATMENT OF AN AQUEOUS SOLUTION OF A CONVENTIONAL POLYVINYLPYRROLIDONE

Ferdinand Straub, Hockenheim; Heinrich Hartmann, Limburgerhof; Paul Naegele, Neuhofen, and Karl Seib, Weinheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Oct. 16, 1980, Ser. No. 197,022

Claims priority, application Fed. Rep. of Germany, Oct. 22, 1979, 2942657

Int. Cl.³ C08L *39/06*

U.S. Cl. 524—458 **3 Claims**

1. A process for the preparation of polyvinylpyrrolidone which has a high viscosity in aqueous solution, wherein a 5–30% strength by weight aqueous solution of a polyvinylpyrrolidone, prepared by free radical polymerization in a conventional manner, is heated at from 20° to 250° C. in the absence of oxygen and in the presence of from 0.5 to 5% by weight, based on polyvinylpyrrolidone, of a water-insoluble organic peroxide, to yield said highly viscous polyvinylpyrrolidone in aqueous solution.

4,330,452

PLASTICIZERS FOR POLYVINYLCHLORIDE COMPRISING A REACTION PRODUCT OF ALKANEDICARBOXIC ACID AND ALKANOLETHER

Frank T. Cook, Baton Rouge, La., assignor to The Dow Chemical Company, Midland, Mich.

Filed Jan. 14, 1980, Ser. No. 111,745

Int. Cl.³ C08K *5/05, 5/06, 5/10*

U.S. Cl. 524—308 **4 Claims**

1. An article comprising a body, at least a portion of which includes a fused polyvinylchloride polymer and a plasticizer which is a diester reaction product formed by reacting an alkanedicarboxylic acid with an alkanolether, wherein the alkanolether is 2-hydroxyethylmethyl ether, 2-hydroxyethylethyl ether, 2-hydroxyethylpropyl ether, 2-hydroxyethylisopropyl ether, 2-hydroxyethyltertiarybutyl ether, 2-hydroxyethyl-2′-methoxyethyl ether, 2-hydroxyethyl-2′-ethoxyethyl ether, 2-hydroxyethyl-2′-propoxyethyl ether, 2-hydroxyethyl-2′-isopropoxyethyl ether, 2-hydroxyethyl-2′-tertiary-butoxyethyl ether, or a mixture thereof.

4,330,453

POLYMERS CHARACTERIZED BY 1,3-IMIDAZOLIDINE-1,3-DIYL RINGS PLASTICIZED WITH ESTERS OF AROMATIC CARBOXYLIC ACIDS

Tad L. Patton, Baytown, Tex., assignor to Exxon Research & Engineering Co., Florham Park, N.J.

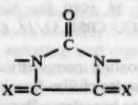
Filed Sep. 29, 1980, Ser. No. 191,883

Int. Cl.³ C08G *18/00;* **C08K** *5/12*

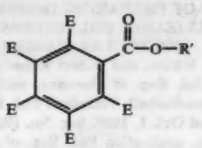
U.S. Cl. 524—294 **28 Claims**

1. A stable meltable composition comprising heterocyclic polymers having the repeating unit:

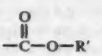
wherein Q is



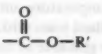
X=O or NH, provided at least one X is O, R is an organic moiety which may be aliphatic, alicyclic, aromatic or mixtures thereof and n is sufficiently large to produce a solid product and a plasticizing amount of an ester of an aromatic poly(carboxylic acid) having the structure:



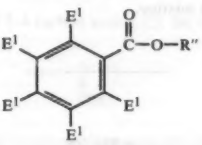
wherein E is



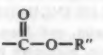
or H, provided at least one E is



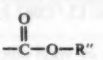
and R′ is a radical independently selected from methyl, ethyl, phenyl, tolyl, benzyl or acetyoxyethyl, mixtures thereof and mixtures of at least 50 weight percent thereof with compounds of the structure:



wherein E^1 is



or H, provided at least one E^1 is



and R″ is an aliphatic radical having 3 to 13 carbon atoms.

4,330,454

STORABLE FLOWABLE POLYPROPYLENE ETHER URETHANE COMPOSITION

Michael E. Kimball, Ashland, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Apr. 6, 1981, Ser. No. 251,637

Int. Cl.³ C08K *5/09*

U.S. Cl. 524—773 **9 Claims**

1. A storable flowable polypropylene ether polyurethane composition comprising a mixture of

(A) an equivalent of a prepolymer formed by reacting polypropylene ether glycol with sufficient organic polyisocyanate to give an excess of about 3 to 15 percent by weight of free NCO in said prepolymer with the proviso that the free NCO is obtained from methane di(phenyl isocyanate);

(B) 0.7 to 1.05 equivalents of a complex of an alkali metal salt with 4,4′-diphenyl methane dianiline, said alkali metal being selected from the class consisting of sodium, potassium and lithium; and

(C) 0.5 to 5.0 percent by weight of urea having a particle size that will pass a 550 Standard U.S. Sieve.

4,330,455

METHOD OF PREPARING DISPERSIONS OF CRYSTALLIZABLE POLYESTERS OF HIGH MOLECULAR WEIGHT

Gerhard Schade, Witten, and Robert Kühnrich, Oer-Erkenschwic, both of Fed. Rep. of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Troisdorf, Fed. Rep. of Germany

Filed Oct. 1, 1980, Ser. No. 192,764

Claims priority, application Fed. Rep. of Germany, Oct. 3, 1979, 2940072

Int. Cl.³ C08K 5/01

U.S. Cl. 523—312 7 Claims

1. A method of preparing a dispersion of a crystalline linear saturated polyester of high molecular weight which comprises contacting said polyester with a high boiling organic liquid whose boiling point is at or above the melting point of the polyester, the weight ratio of polyester to high boiling organic liquid being between 40:60 and 60:40 and heating the resultant mixture at elevated temperature until a homogeneous mass forms, cooling the resultant mass with stirring to such an extent that the melt material is still able to flow or be stirred and then:

A. allowing the material to further cool and stiffen without further stirring; or

B. before or during further cooling diluting the mixture while it is still capable of flowing or being stirred, with an additional amount of a high boiling organic liquid or a liquid miscible therewith and thereafter further cooling the resultant mixture.

4,330,456

CONTINUOUS PROCESS FOR PRODUCING A FINELY DIVIDED AQUEOUS DISPERSON OF A HOMOGENEOUS PHASE OF AT LEAST ONE FUSIBLE SOLID INGREDIENT

Bernard Bonnaud, Sisteron, and Jean-Bernard Pompon, Saint-Auban, both of France, assignors to Chloe Chimie, Puteau, France

Filed Dec. 26, 1978, Ser. No. 973,009

Claims priority, application France, Jan. 5, 1978, 78 00193

Int. Cl.³ C08J 3/20

U.S. Cl. 524—46 13 Claims

1. In the preparation of vinyl chloride based polymer and copolymer compositions in which ingredients such as stabilizers, lubricants, plasticizers, fillers and pigments are mixed with the vinyl chloride based polymers and copolymers to form compositions for subsequent processing wherein the liquid ingredients and at least a part of the fusible solid ingredients are introduced into the mixing zone in the form of one or more finely divided aqueous dispersions to a homogeneous phase and wherein the said finely divided aqueous dispersion or dispersions of a homogeneous phase of at least one fusible solid ingredient and which may include at least one liquid ingredient is produced in a process comprising forming an extemporaneous dispersion by subjecting to a high velocity gradient in an agitation zone (1) an aqueous solution of dispersion additive and (2) the homogeneous phase of the fusible solid ingredients in a molten state and which may include at least one liquid ingredient, the improvement wherein the aqueous solution and the homogeneous phase are introduced continuously into the agitation zone to form a dispersion, continuously removing the formed dispersion from the agitation zone, and regulating the temperature and the flow rate of the aqueous solution and homogeneous phase so that the homogeneous phase of the dispersion reaches its solidification temperature only after the dispersion has been removed from the agitation zone but before thermal equilibrium is reached between the aqueous solution and the homogeneous phase.

4,330,457

POLY(ESTER-AMIDE) CAPABLE OF FORMING AN ANISOTROPIC MELT PHASE DERIVED FROM 6-HYDROXY-2-NAPHTHOIC ACID, DICARBOXYLIC ACID, AND AROMATIC MONOMER CAPABLE OF FORMING AN AMIDE LINKAGE

Anthony J. East, Madison; Larry F. Charbonneau, Chatham, and Gordon W. Calundann, North Plainfield, all of N.J., assignors to Celanese Corporation, New York, N.Y.

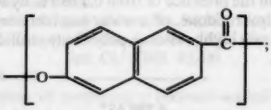
Filed Dec. 9, 1980, Ser. No. 214,557

Int. Cl.³ C08K 3/40; C08G 69/02, 69/12

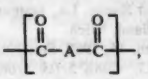
U.S. Cl. 524—602 17 Claims

1. A melt processable poly(ester-amide) capable of forming an anisotropic melt phase at a temperature below approximately 400° C. consisting essentially of recurring moieties I, II, III, and, optionally, IV wherein:

I is



II is



where A is a divalent radical comprising at least one aromatic ring or a divalent trans-1,4-cyclohexylene radical;

III is $-[Y-Ar-Z]-$, where Ar is a divalent radical comprising at least one aromatic ring, Y is O, NH, or NR, and Z is NH or NR, where R is an alkyl group of 1 to 6 carbon atoms or an aryl group; and

IV is $-[O-Ar'-O]-$, where Ar' is a divalent radical comprising at least one aromatic ring;

wherein at least some of the hydrogen atoms present upon the rings optionally may be replaced by substitution selected from the group consisting of an alkyl group of 1 to 4 carbon atoms, an alkoxy group of 1 to 4 carbon atoms, halogen, phenyl, and mixtures thereof, and wherein said poly(ester-amide) comprises approximately 10 to 90 mole percent of moiety I, approximately 5 to 45 mole percent of moiety II, approximately 5 to 45 mole percent of moiety III, and approximately 0 to 40 mole percent of moiety IV.

4,330,458

HIGH SOLIDS COATING COMPOSITION OF A BLEND OF A LOW MOLECULAR WEIGHT ACRYLIC POLYMER AND A MEDIUM MOLECULAR WEIGHT ACRYLIC POLYMER AND AN ALKYLATED MELAMINE CROSS-LINKING AGENT

Harry J. Spinelli, Newark, Del., and Alan L. Thompson, Rochester, Mich., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Apr. 28, 1980, Ser. No. 144,297

Int. Cl.³ C08L 33/14, 61/28

U.S. Cl. 524—512 13 Claims

1. A high solids coating composition comprising at least 50% by weight of a binder of film-forming constituents and up to 50% by weight of a nonaqueous liquid carrier; in which the film-forming constituents consist essentially of

(A) about 5–45% by weight of a medium molecular weight acrylic polymer having a number average molecular weight, determined by gel permeation chromotography, of about 5,000–20,000, a hydroxyl content of about 2–10%

by weight, a glass transition temperature of about −20° C. to +25° C.,

(B) about 10–50% by weight of a low molecular weight acrylic polymer having a number average molecular weight determined as above of about 500–7,500, a hydroxyl content of about 2–10% by weight, a glass transition temperature of about −20° C. to +25° C.; and

wherein the acrylic polymers being the same or different consist essentially of

15–82% by weight of methyl methacrylate, 2–50% by weight of an alkyl methacrylate or an alkyl acrylate each having 2–18 carbon atoms in the alkyl group, and 16–35% by weight of a hydroxy alkyl acrylate or a hydroxy alkyl methacrylate, each having 2–4 carbon atoms in the alkyl group and

wherein the difference in molecular weight between the acrylic polymers is at least 3000; and

(C) about 25–45% by weight of an alkylated melamine formaldehyde cross-linking agent having 1–4 carbon atoms in the alkyl group; and in addition to the film-forming constituents contains about 0.1–2.0% by weight of an acid catalyst.

4,330,459
METHOD OF MANUFACTURING FOUNDRY SAND MOLDS

Hideo Takahashi; Keishiro Igi; Hisashi Ogawara, and Haruo Nakayasu, all of Kurashiki, Japan, assignors to Kuraray Company, Ltd., Okayama, Japan

Filed Dec. 20, 1979, Ser. No. 105,534

Claims priority, application Japan, Dec. 20, 1978, 53-158272; Dec. 20, 1978, 53-158273; Dec. 29, 1978, 53-161913; Jan. 23, 1979, 54-6719; Aug. 6, 1979, 54-100514

Int. Cl.³ B28B *7/34;* C08L *1/26, 33/02;* C08K *3/36*

U.S. Cl. 523—148 **19 Claims**

1. A method of manufacturing foundry sand molds which comprises mixing (a) 0.0015–0.2 parts by weight of a polycarboxylic acid having 2–20 carbon atoms and containing two or more carboxyl groups per molecule or a hydroxyl carboxylic acid having 2–20 carbon atoms and containing at least one carboxyl group and one hydroxyl group; (b) 0.001–0.05 parts by weight of an oxide or hydroxide of magnesium, aluminum, calcium, zinc or iron and (c) one part by weight of a foundry molding sand in the presence of water and (d) 0.006–0.055 parts by weight of a carboxyl group containing polymer selected from the group consisting of homopolymers and copolymers of unsaturated aliphatic carboxylic acids, polyvinyl alcohols containing side chains into which carboxyl groups have been introduced, and carboxymethylcellulose followed by shaping and curing.

4,330,460
PROCESS FOR PREPARING COLORED TONER PARTICLES EMPLOYING A HALOGEN SALT TO INHIBIT THE AQUEOUS PHASE POLYMERIZATION

Thomas R. Hoffend, Webster, and Robert A. Nelson, Fairport, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Apr. 14, 1980, Ser. No. 139,925

Int. Cl.³ C08F *2/20;* C08J *3/20;* G03G *9/08*

U.S. Cl. 524—849 **4 Claims**

1. An improved dispersion polymerization process for preparing colored toner particles which comprises admixing from about 2 to about 15 weight percent of an insoluble colorant, with a vinyl monomer so as to result in the formation of an oil soluble organic phase, agitating said organic phase, admixing from about 0.25 to about 3 percent by weight of an oil soluble polymerization initiator surfactant, followed by admixing said organic phase containing the polymerization initiator with an aqueous phase containing a suspending additive and less than 2,000 parts per million based on the weight of the aqueous phase of an alkali or alkaline earth metal halogen salt resulting in the formation of a suspension, polymerizing said suspension at a temperature of from about 30 degrees Centigrade to about 95 degrees Centigrade, thereby forming polymer particles containing said insoluble colorant and having a particle size in the range of from about 1 micron to about 100 microns, and recovering the polymer particles.

4,330,461
PHOSPHINE OXIDE-SUBSTITUTED PYRIDAZINE AND PYRAZINE

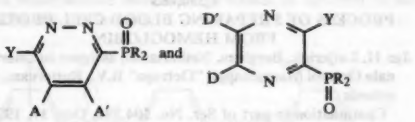
Joseph J. Mrowca, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 49,481, Jun. 18, 1979, Pat. No. 4,234,729. This application May 27, 1980, Ser. No. 153,204

Int. Cl.³ C07F *9/65*

U.S. Cl. 524—100 **10 Claims**

1. Phosphine oxide of the formula selected from the group consisting of



wherein

Y is H, alkyl of 1–4 carbon atoms, Cl, Br, or

each of A and A′ is selected independently from H and alkyl of 1–4 carbon atoms, or A and A′ taken jointly is CH=CH—CH=CH;

each of D and D′ is selected independently from H and CN, or D and D′ taken jointly is CH=CH—CH=CH; and

each R is selected independently from alkyl of 1–4 carbon atoms, cycloalkyl of 5–6 carbon atoms, benzyl, phenyl, tolyl, and chlorophenyl.

8. Polymer having incorporated therein a flame-retarding amount of the phosphine oxide of claim 1.

4,330,462
STABILIZED POLYESTER COMPOSITION

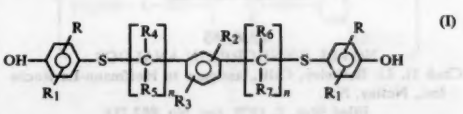
Max H. Keck, Cuyahoga Falls; Richard E. Gloth, Copley, and James J. Tazuma, Stow, all of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed May 12, 1980, Ser. No. 148,062

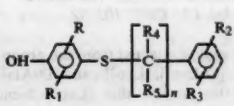
Int. Cl.³ C08K *5/36*

U.S. Cl. 524—331 **10 Claims**

1. A high molecular weight polyester having incorporated therein a stabilizing amount of a phenolic stabilizer selected from at least one of the following generic formulae (I), (II) and (III):

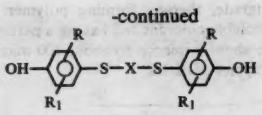


(I)



(II)

-continued



(III)

wherein R, R_1, R_2 and R_3 are the same or different radicals selected from the group consisting of hydrogen radical, alkyl radical of 1 to 18 carbon atoms, aralkyl radical of 7 to 24 carbon atoms; R_4, R_5, R_6 and R_7 are the same or different radicals selected from the group consisting of hydrogen radical, or alkyl radicals of 1 to 8 carbon atoms and n is 1 or 2; and X is selected from the group consisting of alkylene radicals of 2 to 18 carbon atoms, divalent cyclic radicals of 5 to 25 carbon atoms, divalent polycyclic radicals of 7 to 25 carbon atoms.

4,330,463

PROCESS OF PREPARING BLOOD CELL PROTEIN FROM HEMOGLOBIN

Jan H. Luijerink, Berghem, Netherlands, assignor to Internationale Octrooi Maatschappij "Octropa" B.V., Rotterdam, Netherlands

Continuation-in-part of Ser. No. 104,582, Dec. 17, 1979, abandoned. This application Nov. 3, 1980, Ser. No. 203,429

Int. Cl.³ A23J *1/06*

U.S. Cl. 260—112 B **8 Claims**

1. A process of preparing bland blood cell protein isolate from hemoglobin, which comprise converting the hemoglobin into a solid form by dehydration, extracting the heme from this solid by solvent extraction with an organic solvent selected from the group consisting of (a) methanol, (b) a mixture of methanol and ethanol, and (c) a mixture of methanol, ethanol and water, said extraction being effected in the presence of sufficient acid to effect a pH below 3.5, and recovering the blood cell protein isolate as the extraction residue.

4,330,464

ISOLATION OF MICROBIAL PROTEIN WITH REDUCED NUCLEIC ACID CONTENT

George R. Lawford, Hamilton, and Peter N. Lewis, Islington, both of Canada, assignors to George Weston Limited, Toronto, Canada

Filed Jul. 9, 1981, Ser. No. 281,632

Int. Cl.³ A23J *1/18*

U.S. Cl. 260—112 R **10 Claims**

1. A process for the isolation of protein from microbial cells in which the microbial cells are subjected to a treatment to disrupt the cell walls thereby producing a cellular debris fraction and a fraction containing protein and nucleic acid, the two fractions are separated, the fraction containing the protein and nucleic acid is treated with a chelating agent at a pH in the range of from 5.5 to 7.0, the resultant solution is passed over an anion exchange resin which selectively adsorbs the nucleic acid and the resultant eluate is collected.

4,330,465

NOVEL β-ENDORPHIN ANALOGS

Choh H. Li, Berkeley, Calif., assignor to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Mar. 2, 1978, Ser. No. 882,719

Int. Cl.³ C07C *103/52*

U.S. Cl. 260—112.5 E **6 Claims**

1. A β-endorphin analog selected from the group consisting of [Ala^2]-, [D-Leu^2], [D-Lys^2], [Leu^5]-, and [D-Ala^2, D-Leu^5]-β-endorphin, with the proviso that [Leu^5] β-endorphin is essentially free of other pituitary peptides.

4,330,466

PROCESS FOR THE PRODUCTION OF CHOLECYSTOKININ-PANCREOZYMIN C-TERMINAL PEPTIDE AMIDE SULFATE ESTERS

Noboru Yanaihara, Shizuoka, and Nobuo Sugiura, Hajima, both of Japan, assignors to Amano Pharmaceutical Co., Ltd., Nagoya, Japan

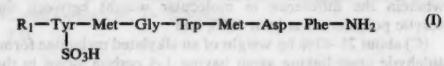
Filed Dec. 16, 1980, Ser. No. 217,187

Claims priority, application Japan, Jun. 10, 1980, 55-78227

Int. Cl.³ C07C *103/52*

U.S. Cl. 260—112.5 R **8 Claims**

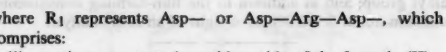
1. A process for the production of a cholecystokinin-pancreozymin C-terminal peptide amide sulfate ester of the formula (I),



(I)

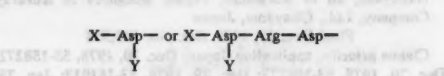
where R_1 represents Asp— or Asp—Arg—Asp—, which comprises:

(1) reacting a protected peptide amide of the formula (II),



(II)

where R_2 represents



wherein X is an amino protecting group and Y is a carboxyl protecting group or the absence of a carboxyl protecting group, with sulfur trioxide-pyridine complex whereby a protected peptide amide sulfate ester is obtained;

(2) isolating said protected peptide amide sulfate ester by removing the reaction solvent to obtain a residue and adding to the residue first a solvent selected from the group consisting of methanol, ethanol, butanol and dimethylformamide and then an aqueous solution of a water soluble calcium salt selected from the group consisting of calcium acetate, calcium propionate, calcium chloride, calcium bromide and calcium nitrate whereby a calcium salt of said protected peptide amide sulfate ester is obtained; and

(3) removing the amino protecting group and, where the carboxyl group is protected, the carboxyl protecting group, and desalting the resulting non-protected calcium salt.

4,330,467

DISUBSTITUTED ISOTHIAZOLE AZO DYES CONTAINING TETRAHYDROQUINOLINE TYPE COUPLERS

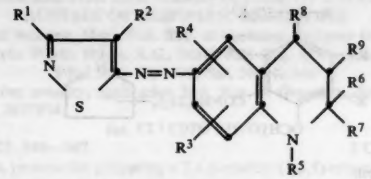
Jean C. Fleischer; Ronald J. Maner, and Gary T. Clark, all of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Mar. 3, 1980, Ser. No. 126,631

Int. Cl.³ C07C *107/04;* C09B *29/039, 29/36, 29/44*

U.S. Cl. 260—155 **5 Claims**

1. A compound of the formula

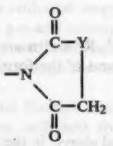


wherein

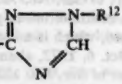
R^1 and R^2 are each selected from cyano, bromo, chloro, formyl, lower alkoxycarbonyl, lower alkyl, lower alkylsulfonyl, thiocyanato, carbamoyl, lower alkylcarbamoyl, hydroxy substituted lower alkylcarbamoyl, and lower alkanoyl;

R^3 and R^4 are each selected from hydrogen, fluorine, chlorine, bromine, lower alkyl, cycloalkyl, lower alkoxy, phenoxy, lower alkylthio, arylthio, and radicals having the formula —NH—X—R^{10} in which X is —CO—, —COO—, or —SO_2 and R^{10} is selected from lower alkyl and lower alkyl substituted with halogen, hydroxy, phenoxy, aryl, cyano, cycloalkyl, lower alkylsulfonyl, lower alkylthio, lower alkanoyloxy, or lower alkoxy, and when X is —CO—, R^{10} also can be hydrogen, amino, lower alkylamino, lower dialkylamino, arylamino, aryl, or furyl;

R^5 is selected from hydrogen; cycloalkyl; cycloalkyl substituted with one or two groups selected from lower alkyl, —OH, lower alkoxy, halogen and hydroxy substituted lower alkyl; phenyl; phenyl substituted with lower alkyl, lower alkoxy, halogen, lower alkanoylamino, cyano or lower alkoxycarbonyl; straight or branched lower alkenyl; straight or branched alkyl of 1–8 carbons; and straight or branched alkyl of 1–8 carbons substituted with the following: hydroxy; halogen; cyano; succinimido; glutarimido; phthalimido; 2-pyrrolidono; cyclohexyl; phenyl; phenyl substituted with lower alkyl, lower alkoxy, halogen, lower alkanoylamino, cyano or lower alkoxycarbonyl; lower alkanoylamino; vinylsulfonyl; acrylamido; phthalimidinyl; benzoylsulfonicimidyl; lower alkylsulfonamido; phenylsulfonamido; lower alkoxycarbonylamino; lower alkylcarbamoyloxy; lower alkoxycarbonyl; lower alkoxycarbonyloxy; groups of the formula



wherein Y is —NH—, —NH—lower alkylene, —O—, —S—, or —CH_2O—; —S—R^{11} wherein R^{11} is lower alkyl, phenyl, phenyl substituted with halogen, lower alkyl, lower alkoxy, lower alkanoylamino, cyano, or lower alkoxycarbonyl, pyridyl, pyrimidinyl, benzoxazolyl, benzimidazolyl, benzothiazolyl, or



;

—OXR^{10}; —NH—X—R^{10}; —X—R^{10}; —$CONR^{12}R^{12}$; —$SO_2NR^{12}R^{12}$; wherein R^{10} and X are as defined as above and each R^{12} is selected from H and R^{10}; lower alkoxy; lower alkoxy substituted with hydroxy, cyano, lower alkanoyloxy, or lower alkoxy; phenoxy; or phenoxy substituted with one or more of lower alkyl, lower alkoxy or halogen;

R^6, R^7, and R^8 are each selected from hydrogen and lower alkyl; and R^9 is selected from H, —OH, —Cl, —$CONH_2$, —CONH—lower alkyl, lower alkoxy, phenoxy, —SR^{11}, and —OXR^{10} wherein R^{10} and R^{11} are as defined above.

4,330,468

WATER SOLUBLE MONOAZO DYES FOR NYLON

David Brierley; Denis R. A. Ridyard, and Michael Yelland, all of Manchester, England, assignors to Imperial Chemical Industries, Limited, London, England

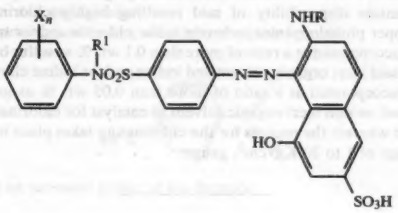
Continuation of Ser. No. 768,622, Feb. 14, 1977, abandoned. This application Jul. 26, 1978, Ser. No. 928,260

Claims priority, application United Kingdom, Mar. 30, 1976, 12735/76

Int. Cl.³ C09B *29/01, 29/30;* **D06P** *1/39, 3/24*

U.S. Cl. 260—198 **2 Claims**

1. A water-soluble monoazo dye which, in the form of the free acid, has the formula:



wherein R represents hydrogen or unbranched alkyl having from 1 to 4 carbon atoms, R^1 represents hydrogen, hydroxyethyl or hydroxypropyl, X represents unbranched alkyl having from 1 to 6 carbon atoms, chlorine, trifluoromethyl, sulpho, sulphatoethylsulphonyl or lower alkoxycarbonyloxy, and n represents an integer of from 0 to 2.

4,330,469

REACTIVE DYES, PROCESSES FOR THEIR MANUFACTURE AND THEIR USE

Sandor Gati, Birsfelden, and Gerd Hölzle, Liestal, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

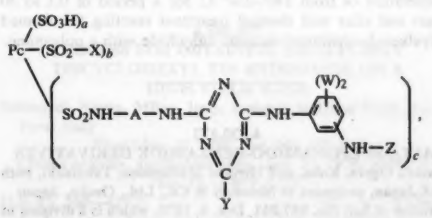
Continuation of Ser. No. 10,207, Feb. 8, 1979, abandoned. This application Nov. 25, 1980, Ser. No. 210,505

Claims priority, application Switzerland, Feb. 16, 1978, 1697/78

Int. Cl.³ C09B *47/04*

U.S. Cl. 260—242.2 **4 Claims**

1. Reactive dyes of the formula



(1)

wherein Pc is the radical of a copper or nickel phthalocyanine, X is —NH_2 or the radical of an aliphatic, cycloaliphatic, aromatic or heterocyclic amine, A is a phenylene radical that does not contain sulfo as substituent, Y is fluorine or chlorine, W is sulfo or carboxyl, and Z is a alkoxy- or alkoxyalkoxy-chlorotriazino, and a, b and c are whole or fractional number with the

proviso that each of a and c is at least 1, b is a value between 0 and 2 and the sum of a+b+c must be 4.

4,330,470

PROCESS FOR PRODUCING HIGHLY CHLORINATED COPPER PHTHALOCYANINE

Tomio Segawa, and Sakae Kuramoto, both of Yokohama, Japan, assignors to Kawasaki Kasei Chemicals Ltd., Tokyo, Japan

Filed Dec. 18, 1980, Ser. No. 217,744
Claims priority, application Japan, Jan. 31, 1980, 55/104474
Int. Cl.³ C09B 47/10
U.S. Cl. 260—245.84 6 Claims

1. In a process for producing a highly chlorinated copper phthalocyanine by chlorinating a copper phthalocyanine in the presence of a catalyst for chlorination in a solvent by charging chlorine under an elevated pressure, characterized in that said chlorination is carried out in an inert organic solvent incorporating chlorosulfonic acid and/or pyrosulfuryl chloride at a ratio of 1 to 30 wt. % based on said inert organic solvent which maintain dispersibility of said resulting highly chlorinated copper phthalocyanine, wherein sulfur chloride and/or sulfur is incorporated at a ratio of more than 0.1 wt. % as sulfur based on said inert organic solvent and iodine and/or iodine chloride is incorporated at a ratio of more than 0.05 wt. % as iodine based on said inert organic solvent as catalyst for chlorination, and wherein the process for the chlorinating takes place in the range of 1 to 20 Kg/cm^2, gauge.

4,330,471

PROCESS FOR THE PREPARATION OF ALKYLENE POLYAMINE DERIVATIVES OF POLYALKENYL-SUBSTITUTED SUCCINIC ANHYDRIDE

Henricus G. P. van der Voort, Amsterdam, Netherlands, assignor to Shell Oil Company, Houston, Tex.

Division of Ser. No. 194,644, Oct. 6, 1980, Pat. No. 4,282,157. This application Mar. 26, 1981, Ser. No. 247,653
Claims priority, application United Kingdom, Oct. 24, 1979, 7936863
Int. Cl.³ C07D 207/412
U.S. Cl. 548—546 2 Claims

1. A process for the preparation of alkylene polyamine derivatives of polyalkenyl-substituted succinic anhydride which comprises preparing a mixture of an alkene polymer and maleic anhydride, contacting the mixture with chlorine at elevated temperature, then thermally treating the reaction mixture, then removing excess maleic anhydride, subjecting the formed polyalkenyl succinic anhydride to a thermal treatment at a temperature of from 140°–230° C. for a period of 0.1 to 30 hours and after said thermal treatment reacting the formed polyalkenyl-substituted succinic anhydride with a polyamine.

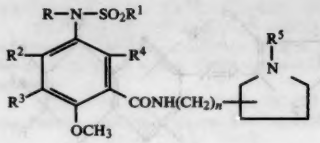
4,330,472

META-SULFONAMIDO-BENZAMIDE DERIVATIVES

Masaru Ogata, Kobe, and Hiroshi Matsumoto, Takatsuki, both of Japan, assignors to Shionogi & Co., Ltd., Osaka, Japan

Division of Ser. No. 967,011, Dec. 6, 1978, which is a division of Ser. No. 872,584, Jan. 26, 1978, abandoned. This application Jun. 25, 1980, Ser. No. 162,793
Claims priority, application Japan, Jan. 27, 1977, 52-8443; Aug. 8, 1977, 52-94884
Int. Cl.³ C07D 207/08
U.S. Cl. 548—567 2 Claims

1. A process for preparing a compound of the formula:



wherein

R is hydrogen, C_1–C_6 alkyl, cyano or C_1–C_6 alkanesulfonyl,

R^1 is C_1–C_6 alkyl, phenyl, amino, C_1–C_6 alkylamino, C_2–C_{12} dialkylamino or C_4–C_5 alkyleneamino,

R^2 is hydrogen, halogen, C_1–C_6 alkyl, C_2–C_{12} dialkylamino or C_1–C_6 alkoxy,

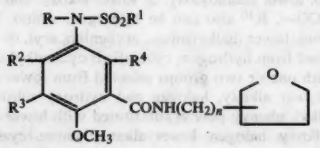
R^3 is hydrogen, methyl or methoxy,

R^4 is hydrogen or halogen,

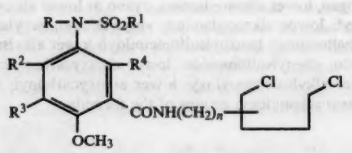
R^5 is C_1–C_6 alkyl, C_2–C_6 alkenyl, C_3–C_6 cycloalkyl, benzyl or halobenzyl, and

n is zero or 1,

or a pharmaceutically acceptable acid addition salt of said compound, which comprises the steps of reacting a tetrahydrofuryl compound of the formula:



wherein R, R^1, R^2, R^3, R^4 and n are each as defined above, with thionyl chloride in an inert solvent at a temperature above room temperature, and isolating and reacting the resultant dichloro compound of the formula:



wherein R, R^1, R^2, R^3, R^4 and n are each as defined above, with an amino compound of the formula:

$$R^5—NH_2$$

wherein R^5 is as defined above, in the presence or absence of a suitable solvent at a temperature above room temperature.

4,330,473

RECORDING MATERIAL

Yoshihiro Hatano, Osaka, and Kenji Yamamoto, Yao, both of Japan, assignors to Yamamoto Kagaku Gosei Kabushiki Kaisha, Osaka, Japan

Continuation-in-part of Ser. No. 783,475, Mar. 31, 1977, abandoned, which is a continuation-in-part of Ser. No. 529,126, Dec. 3, 1974, abandoned, which is a continuation-in-part of Ser. No. 295,580, Oct. 6, 1972, abandoned, which is a continuation-in-part of Ser. No. 123,070, Mar. 10, 1971, abandoned, and Ser. No. 219,892, Jan. 21, 1972, abandoned. This application Nov. 26, 1980, Ser. No. 210,867
Claims priority, application Japan, Jul. 23, 1970, 45-64814
Int. Cl.³ C07D 493/10
U.S. Cl. 549—226 1 Claim

1. 3-diethylamino-6-methyl-7-(2',4'-dimethylanilino)fluoran.

4,330,474

PROCESS FOR THE MANUFACTURE OF CYCLIC ACETALS OF ALIPHATIC ALDEHYDES

Rudolf Nehring, Marl, Fed. Rep. of Germany, assignor to Chemische Werke Huels, A.G., Marl, Fed. Rep. of Germany

Filed May 25, 1979, Ser. No. 42,646

Claims priority, application Fed. Rep. of Germany, Jun. 26, 1978, 2827974

Int. Cl.[3] C07D *319/00*

U.S. Cl. 549—367 5 Claims

1. A process for preparing a 2,4,6-trialkyl-(1,3,5)-trioxane by cyclizing under anhydrous conditions a saturated, aliphatic aldehyde, consisting essentially of contacting a saturated, aliphatic aldehyde of 2–16 carbon atoms with a silica gel of 90% to 97% SiO_2.

4,330,475

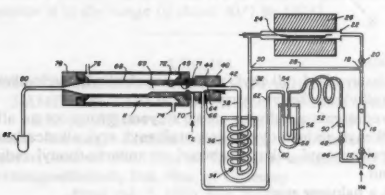
AEROSOL DIRECT FLUORINATION METHOD AND APPARATUS

James L. Adcock, 7608 Queensbury Dr., Knoxville, Tenn. 37919, and Ehrengard B. Renk, Department of Chemistry, University of Tennessee, Knoxville, Tenn. 37916

Filed Dec. 6, 1979, Ser. No. 100,761

Int. Cl.[3] C07B *9/00;* C07D *319/10*

U.S. Cl. 549—380 12 Claims



1. A process for fluorinating a material, comprising:

a. generating an aerosol containing the material to be fluorinated by forming a colloidal suspension of solid carrier particles in an inert gas and subsequently condensing the material to be fluorinated onto said carrier particles;

b. flowing said aerosol through the reaction zone of a fluorination reactor; and,

c. introducing elemental fluorine into the flow of said aerosol under conditions sufficient for fluorination of said material to occur.

4,330,476

PREPARATION OF CATIONIC TRIARYLMETHANE DYESTUFFS

Karl H. Hermann, Leverkusen, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

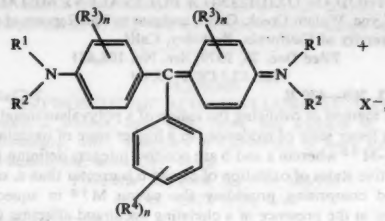
Filed Jun. 26, 1980, Ser. No. 163,363

Claims priority, application Fed. Rep. of Germany, Jul. 13, 1979, 2928466

Int. Cl.[3] C09B *11/10;* C07D *209/04, 265/30, 209/18*

U.S. Cl. 260—393 3 Claims

1. A one-pot process for the synthesis of a triarylmethane dyestuff of the formula



in which

R^1 and R^2 represent optionally substituted alkyl, aryl or aralkyl or

R^1 and R^2, together or with the ortho-position of the phenyl ring, form a heterocyclic ring and

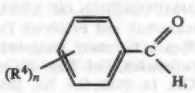
R^1 can additionally represent hydrogen,

R^3 and R^4 denote hydrogen or non-ionic substituents,

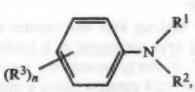
n represents an integer from 1 to 4 and

X^- denotes an anion,

comprising condensing an aldehyde of the formula



with an aromatic amine of the formula



optionally in the presence of urea, and oxidizing the reaction mixture thus obtained with oxygen in the presence of a catalytic amount of a benzoquinone substituted by halogen or cyano or of a phenanthrenequinone substituted by nitro, and in the presence of 1 to 20% of a nitrogen oxide selected from the group consisting of nitrogen monoxide, nitrogen dioxide, sodium nitrite and iron-III nitrate or a substance which produces such nitrogen oxide under the reaction conditions.

4,330,477

PROCESS FOR OBTAINING HIGH-PURITY TRICYCLOHEXYL TIN HYDROXIDE ON A HIGH-YIELD BASIS

Raimondo Motta, Milan, Italy, assignor to Oxon Italia S.p.A., Pero, Italy

Filed May 20, 1980, Ser. No. 151,594

Claims priority, application Italy, Jun. 27, 1979, 23893 A/79

Int. Cl.[3] C07F *7/22*

U.S. Cl. 260—429.7 4 Claims

1. A process for producing tricyclohexyl tin hydroxide, comprising reacting 3 mols of cyclohexyl magnesium halide with 1 mol of tin tetrahalide, hydrolyzing the reaction product, separating water from the reaction product, and thereafter adding further cyclohexyl magnesium halide to the reaction product until the mol ratio between the cyclohexyl magnesium halide and the tin tetrahalide is between 3.5:1 and 3.9:1.

4,330,478

METHOD OF OXIDIZING A POLYVALENT METAL

Scott Lynn, Walnut Creek, Calif., assignor to The Regents of the University of California, Berkeley, Calif.

Filed Dec. 26, 1979, Ser. No. 106,651
Int. Cl.[3] C07F *15/02*
U.S. Cl. 260—439 R 7 Claims

1. A method of oxidizing the cation of a polyvalent metal M from a lesser state of oxidation, to a higher state of oxidation, $M^{+a} \rightarrow M^{+b}$ wherein a and b are positive integers defining the respective states of oxidation of M and b is greater than a, said method comprising providing the cation M^{+a} in aqueous solution in the presence of a chelating agent and effecting the oxidation, $M^{+a} \rightarrow M^{+b}$, by contact with molecular oxygen, said chelating agent being an aliphatic polycarboxylic acid capable of forming chelates with one or both M^{+a} and M^{+b}, having a pK_2 not greater than about 4.5 and being devoid of readily oxidizable groups and groups which are readily hydrolyzable to readily oxidizable groups.

4,330,479

THERMAL DECOMPOSITION OF ARYL URETHANES

Franz Merger, Frankenthal, and Friedrich Towae, Ludwigshafen, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Oct. 14, 1980, Ser. No. 196,236
Claims priority, application Fed. Rep. of Germany, Oct. 20, 1979, 2942543
Int. Cl.[3] C07C *118/00*
U.S. Cl. 260—453 P 14 Claims

1. A process for making aryl isocyanates comprising thermally decomposing aryl urethanes at a temperature between 175° C. and 600° C. in the presence of a catalyst, present in a heterogeneous phase, said catalyst being a metal selected from the group consisting of zinc and aluminum.

4,330,480

PREPARATION OF AMINOALKYL HALF-ESTERS OF SULFURIC ACID

Otto Hertel, Ludwigshafen; Karl-Heinz Beyer, Frankenthal; Albrecht H. Wallis, Ludwigshafen; Klaus Wulz, Ludwigshafen, and Kamuran Izi, Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Continuation of Ser. No. 73,643, Sep. 10, 1979, abandoned. This application Feb. 4, 1981, Ser. No. 231,322
Claims priority, application Fed. Rep. of Germany, Sep. 18, 1978, 2840554
Int. Cl.[3] C07C *141/02*
U.S. Cl. 260—458 R 7 Claims

1. A process for the preparation of an aminoalkyl half-ester of sulfuric acid, comprising;

simultaneously adding an aminoalkanol and sulfuric acid to a suspending medium, boiling at 70°–150° C., with vigorous mixing,

distilling off the water formed during the reaction, and any water introduced with the starting materials, together with a part of the suspending medium, as an azeotrope,

separating off the water from the condensed azeotrope,

vaporizing the suspending medium and recycling the gaseous suspending medium to the reaction mixture, and introducing fresh suspending medium, as a gas, into the reaction mixture in order to compensate for the suspending medium which has been distilled off.

4,330,481

PROCESS FOR PREPARING POLYCARBONATES

John F. Timberlake; Daniel W. Baugh, Jr., both of Baton Rouge, and Bobby Burkes, New Orleans, all of La., assignors to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 973,211, Dec. 26, 1978. This application Aug. 11, 1980, Ser. No. 177,030
Int. Cl.[3] C07C *69/96*
U.S. Cl. 260—463 10 Claims

1. A process for the preparation of polycarbonate type surfactants comprising reacting ethylene carbonate and a monohydroxy alcohol in the presence of an alkali metal salt catalyst at a temperature of about 130° C. to about 210° C.

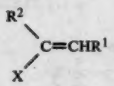
4,330,482

PROCESS FOR THE PREPARATION OF HALOGENOALKENES

Hellmut Hoffmann, Wuppertal, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Dec. 18, 1980, Ser. No. 218,394
Claims priority, application Fed. Rep. of Germany, Jan. 3, 1980, 3000065
Int. Cl.[3] C07C *21/19, 69/743, 49/567, 121/48*
U.S. Cl. 260—465 G 10 Claims

1. In the process for the production of a halogenoalkene of the formula



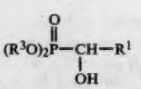
in which

R^1 is an alkyl, alkenyl, alkinyl, cycloalkyl, cycloalkenyl, aralkyl, aralkenyl or aryl radical,

R^2 represents a halogen atom, a cyano group, or an alkyl, alkenyl, alkinyl, cycloalkyl, aralkenyl, aryl, alkylcarbonyl, arylcarbonyl, alkoxycarbonyl or aminocarbonyl radical, and

X is a halogen atom,

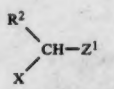
in which an α-hydroxy-phosphonic acid ester of the formula



in which

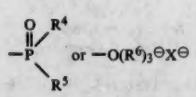
R^3 each independently is an alkyl or phenyl radical, or the two radicals R^3 together are an alkanediyl (alkylene) radical,

is reacted with a phosphorus-containing olefinating agent of the formula



in which

Z^1 is the phosphorus-containing radical



in which

R^4 and R^5 each independently is an alkyl, phenyl, alkoxy or

phenoxy radical or together are an alkanedioxy radical, and

R^6 is an alkyl or phenyl radical,

in the presence of a base at a temperature between about −70 and +150° C., the improvement which comprises effecting the reaction in the presence of a halogen carrier of the formula

$$R^8—CX_3$$

in which

R^8 is a halogen atom, an optionally halogen-substituted alkyl radical or an optionally halogen-substituted phenyl radical.

4,330,483

HYDROCYANATION OF OLEFINS

Morris Rapoport, Orange, Tex., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Feb. 24, 1981, Ser. No. 237,614

Int. Cl.³ C07C *120/02, 121/26*

U.S. Cl. 260—465.8 R 6 Claims

1. In a process for the production of dinitriles by the continuous hydrocyanation of 3- and/or 4-pentenenitriles in the presence of a zero-valent nickel containing catalyst promoted with at least one triaryl organoborane, the improvement which comprises maintaining the temperature of the hydrocyanation at less than about 75° C., the amount of hydrogen cyanide introduced into the reaction in an amount such that the mol ratio of hydrogen cyanide to the 3- and/or 4-pentenenitriles is in the range of about 0.18/1 to 0.7/1; the mol ratio of hydrogen cyanide to the zero-valent nickel catalyst is in the range of about 10/1 to 116/1 and the mol ratio of hydrogen cyanide to promoter is in the range of about 30/1 to 400/1.

4,330,484

DIASTEREOMERIC SALTS OF MALIC ACID AND 2-AMINOBUTANOL, AND PROCESS FOR THE RESOLUTION OF RADEMIS MAIC ACID

Wilfried Berning, Kirchheimbolanden, and Hardo Siegel, Speyer, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Jul. 7, 1980, Ser. No. 166,576

Claims priority, application Fed. Rep. of Germany, Aug. 22, 1979, 2933895

Int. Cl.³ C07C *91/04;* C07B *19/00*

U.S. Cl. 260—501.17 5 Claims

1. The diastereomeric salts of R(−)-2-aminobutan-1-ol and S(+)-2-aminobutan-1-ol with D(+)- and L(−)-malic acid.

2. A process for resolving malic acid by fractional crystallization of diastereometric salts of malic acid comprising reacting D,L-malic acid with optically active 2-aminobutan-1-ol in solution, separating the crystallized diastereomeric salt from the mother liquor and recovering D(+)-malic acid, L(−)-malic acid and optically active 2-aminobutan-1-ol from said crystallized salt and said mother liquor.

4,330,485

PREPARATION OF PERCARBOXYLIC ACIDS

Jean-Pierre Schirmann, Oullins, France, assignor to PCUK Produits Chimiques Ugine Kuhlmann, Courbevoie, France

Filed Jun. 25, 1980, Ser. No. 162,936

Claims priority, application France, Jul. 9, 1979, 79 17720

Int. Cl.³ C07C *179/10*

U.S. Cl. 260—502 R 9 Claims

1. A process for the preparation of percarboxylic acid which comprises reacting hydrogen peroxide and a water-miscible saturated aliphatic carboxylic acid at a temperature between about 40° and 100° C., in the presence of a selenium oxide, tellurium oxide, arsenic oxide, antimony oxide, bismuth oxide or boron oxide catalyst, and used at the ratio of between about 0.001 to 0.1 mole per mole of hydrogen peroxide, and in the presence of an organic solvent boiling below about 100° C. and continuously eliminating the water by azeotropic distillation contributed by the reactants and that formed during the reaction, said organic solvent being used in an amount falling between about 50 and 75% by weight of the reaction mixture.

4,330,486

BIS(PHOSPHONIC ACID) DIFLUOROMETHANE

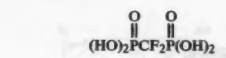
Donald J. Burton, Iowa City, Iowa, and Richard M. Flynn, Bethesda, Md., assignors to University of Iowa Research Foundation, Iowa City, Iowa

Filed Apr. 28, 1980, Ser. No. 143,995

Int. Cl.³ C07F *9/38, 9/40*

U.S. Cl. 260—502.4 P 1 Claim

1. The compound:



4,330,487

N,N-DIMETHYLENE PHOSPONIC ACIDS OF ALKYLENE DIAMINES

Derek Redmore, Webster Groves, and William S. Paley, Maryland Heights, both of Mo., assignors to Petrolite Corporation, St. Louis, Mo.

Filed Oct. 29, 1980, Ser. No. 201,866

Int. Cl.³ C07F *9/38;* C02F *1/70*

U.S. Cl. 260—502.5 1 Claim

1. The composition of the formula

where n=6.

4,330,488

PROCESS OF PREPARING 3-BENZYLIDENE-2-OXO-10-BOMANESULFONIC ACID

Claude Bouillon, Eaubonne; Charles Vayssie, Aulnay-sous-Bois, and Francoise Richard, Montreuil-sous-Bois, all of France, assignors to L'Oreal, Paris, France

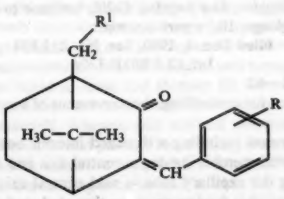
Continuation of Ser. No. 922,083, Jul. 5, 1978, abandoned, which is a division of Ser. No. 497,469, Aug. 14, 1974, Pat. No. 4,165,336, which is a continuation-in-part of Ser. No. 440,570, Feb. 7, 1974, abandoned. This application Dec. 27, 1979, Ser. No. 107,641

Claims priority, application Luxembourg, Feb. 19, 1973, 67061

Int. Cl.³ C07C *143/24*

U.S. Cl. 260—511 6 Claims

1. A process for preparing a compound of the formula



wherein R is selected from the group consisting of hydrogen, methyl, chlorine and fluorine; and

R^1 is SO_3M wherein M represents sodium comprising reacting anhydrous camphosulfonic acid with sodium methylate in an inert solvent, and reacting the resulting product with an aromatic aldehyde selected from the group consisting of benzaldehyde, p-tolualdehyde, monochloroben-

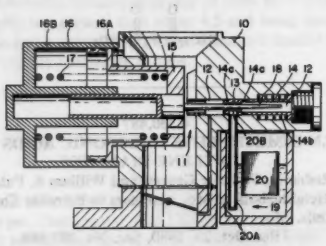
zaldehyde and monofluorobenzaldehyde in an inert solvent.

4,330,489

VARIABLE VENTURI TYPE CARBURETOR

Takaaki Ito, 527 Imasato, Susono-shi, Shizuoka-ken, and Norihiko Nakamura, 3-8-14 Fuyodai, Mishima-shi, Shizuoka-ken, both of Japan

Division of Ser. No. 72,996, Sep. 6, 1979, Pat. No. 4,289,715. This application Feb. 10, 1981, Ser. No. 233,161
Claims priority, application Japan, Sep. 11, 1978, 53-111435
Int. Cl.³ F02M 9/06
U.S. Cl. 261—44 C **7 Claims**



1. Variable venturi type carburetor having a body including a float chamber comprising:

a venturi unit vertically formed in a carburetor body;

a horizontal fuel suction-ejection hole assembly, one end of which opens into said venturi unit;

a throttle provided inside of and midway of the fuel suction-ejection hole assembly;

a suction piston opposed to the venturi opening end of said fuel suction-ejection hole assembly, movable into or out of said venturi unit;

a tapered needle attached to said suction piston, a tip portion of said needle extending through said throttle;

a fuel suction pipe fitted to the carburetor body beneath said throttle, a bottom portion of said pipe opening into the float chamber and a top portion opening into said fuel suction-ejection hole assembly; and

fuel path means formed in the throttle and intersecting with said fuel suction-ejection hole assembly in a substantially orthogonal manner.

4,330,490

METERING DEVICE

Gerald V. Higgins, Los Angeles, Calif., assignor to Seymour J. Kurtz, Chicago, Ill., a part interest

Filed Dec. 4, 1980, Ser. No. 212,824
Int. Cl.³ B01F 3/04
U.S. Cl. 261—62 **16 Claims**

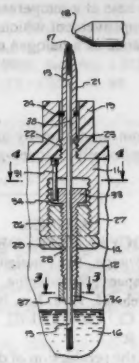
9. A device for controlling the movement of a capillary tube comprising:

housing means including a threaded interior bore;

an elongated member having a central axis and adapted for holding the capillary tube in said central axis, said elongated member having an outer threaded surface;

displacing means threadedly coupled between said housing and said elongated member having a number of threads per unit axial length on the outside thereof which is different from the number of threads per unit axial length on the inside thereof to thereby provide a reduction gear effect; and

wherein said housing includes securing means for engaging said elongated member to enable it to move longitudinally with respect to said central axis while retaining said elongated member rotationally stationary around said central axis with respect to said housing.

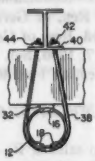


4,330,491

COOLING TOWER WATER DISTRIBUTION PIPE AND SUSPENSION SYSTEM THEREFOR

Mahendra F. Doshi; Martin V. Gruber, and Frederick R. Steinlein, all of Tampa, Fla., assignors to Zurn Industries, Erie, Pa.

Filed Oct. 8, 1980, Ser. No. 194,966
Int. Cl.³ B01F 3/04
U.S. Cl. 261—111 **3 Claims**



1. In a counterflow cooling tower including structural supports for a water distribution pipe, the improvement comprising:

A. a plurality of spaced horizontal concrete beam structural supports;

B. a distribution pipe formed of fiberglass reinforced polyester resin having longitudinal reinforcing integral ribs formed of an increased wall thickness extending along an interior surface of the pipe throughout the length thereof, one such rib positioned along the pipe top and at least one such rib positioned along the pipe bottom;

C. external ring stiffeners positioned about the pipe and spaced at the same intervals as the structural supports; and

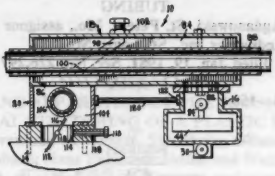
D. a suspension system extending about the supports and the external ring stiffeners to suspend the pipe transverse of and below the supports, said suspension system including groups of two lengths of stainless steel cable extending about the pipe, each cable connected above the supports and forming loops below the support, each loop extending about a ring stiffener, and bearing pads positioned between the beams and pipes, said pipe having an end cap at one end and secured within a water trough at its opposite end.

4,330,492

CARBURETOR

Russell R. Mohr, 103 Village Ave., Cannon Falls, Minn. 55009

Filed Nov. 3, 1980, Ser. No. 203,041
Int. Cl.³ F02M 15/02
U.S. Cl. 261—145 16 Claims



1. Apparatus for conditioning an air/fuel mixture for introduction into the cylinders of an internal combustion engine, comprising:

(a) fuel inlet means;

(b) air inlet means;

(c) a mixing chamber into which said fuel and air inlet means converge and wherein fuel and air are mixed;

(d) means for selectively adjusting the ratio of fuel to air in said mixture;

(e) a plenum positioned above said mixing chamber and having an entrance at said mixing chamber providing communication between said plenum and said mixing chamber and an outlet providing communication between said plenum and said cylinders, said plenum including at least one duct extending through said plenum, said duct having an outer wall and an inner wall defining an annular chamber surrounding an inner passage through which hot exhaust gases can be made to pass, said annular chamber effectuating heat transfer from said hot exhaust gases traveling through said passage to said mixture, whereby said mixture is further vaporized; and

(f) means for conveying said mixture from said outlet of said plenum to said cylinders, said means including a valve mounted in a restriction of said outlet for varying the rate of mixture transfer from said plenum to said cylinders, said plenum trapping and retaining said mixture until said valve opens said restriction and enables conveyance of said mixture to the cylinders; whereby said mixture is retained in said plenum and continuously heated and further vaporized until needed at said cylinders.

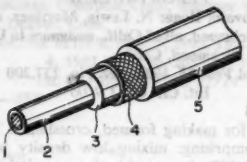
4,330,493

PROCESS FOR PREPARING A HIGH VOLTAGE IGNITION CABLE HAVING LOW ELECTROSTATIC CAPACITY

Yoshimi Miyamoto, Kariya; Yasuo Toriumi, and Keiichi Kojima, both of Osaka, all of Japan, assignors to Sumitomo Electric Industries, Ltd., Tokyo and Nippondenso Co., Ltd., Aichi, both of, Japan

Filed Feb. 13, 1981, Ser. No. 234,061
Claims priority, application Japan, Feb. 13, 1980, 55-17114
Int. Cl.³ H01B 0/00
U.S. Cl. 264—22 6 Claims

1. A process for preparing a high voltage ignition cable having a low electrostatic capacity comprising a resistive-conductor core, an insulator layer and a jacket, which comprises preparing a resistive conductor core comprising a tension member consisting of a fiber bundle and a semiconductive material provided on at least on the circumferential surface thereof, extrusion coating a polyolefin resin comprising a polymer blend of polyethylene and a non-crystalline polyolefin on the circumferential surface of the resistive-conductor core to form an insulator layer, irradiating the insulator layer with an electron beam to effect cross-linking of the resin, extrusion coating a polyolefin resin, without providing a reinforcing layer or after providing a reinforcing layer, on the cross-linked



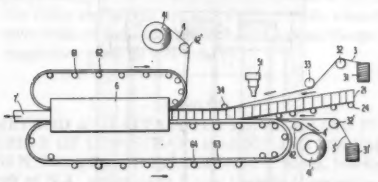
insulator to form the jacket and irradiating the jacket with an electron beam.

4,330,494

REINFORCED FOAMED RESIN STRUCTURAL MATERIAL AND PROCESS FOR MANUFACTURING THE SAME

Akira Iwata, Shiga, and Shizunobu Fukushima, Takatsuki, both of Japan, assignors to Sekisui Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Sep. 11, 1979, Ser. No. 74,458
Claims priority, application Japan, Sep. 13, 1978, 53/126908[U]; Sep. 14, 1978, 53/112984; Oct. 18, 1978, 53/142891[U]; Oct. 20, 1978, 53/129696
Int. Cl.³ B32B 3/12
U.S. Cl. 264—46.2 11 Claims



1. A process for preparing a foamed resin structural material which comprises placing a core material having a honeycomb structure between two or more layers of fiber materials, supplying a foamable thermosetting resinous liquid to the voids of the honeycomb structure, introducing the resulting laminate into a passage for molding and heating said previously supplied foamable thermosetting resinous liquid in said passage to cause said resinous liquid to foam and thereby fill the voids of said honeycomb structure and at the same time permeate and cover said fiber materials, wherein said method comprises feeding said core material to said passage for molding from an elevated position wherein said core material is fed to said passage for molding in a descending manner and so that the angle of descent is decreased as said core material advances toward said passage for molding, and applying said thermosetting resinous liquid from a resinous liquid-injecting apparatus situated above to the voids of the honeycomb structure such that said resinous liquid flows down the honeycomb structure toward the passage for molding, while the honeycomb structure is elevated from the passage for molding and does not come entirely into contact with the passage for molding.

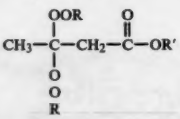
4,330,495

NOVEL METHOD OF CROSSLINKING/FOAMING OF LOW DENSITY POLYETHYLENE USING LINEAR PEROXYKETALS

Reidar Halle, Novato; Roger N. Lewis, Martinez, and John R. Muenchow, Richmond, all of Calif., assignors to U.S. Peroxygen Company, Richmond, Calif.

Filed Feb. 23, 1981, Ser. No. 237,200
Int. Cl.[3] C08J 9/06
U.S. Cl. 264—54 12 Claims

1. A method for making foamed, crosslinked low density polyethylene comprising: mixing low density polyethylene with about 0.10–10% by weight of a crosslinking/blowing agent having the formula:



wherein each R is a t-alkyl group bonded through its tertiary carbon atom and having 4–8 carbon atoms; and R′ is an alkyl group of 1–6 carbon atoms;

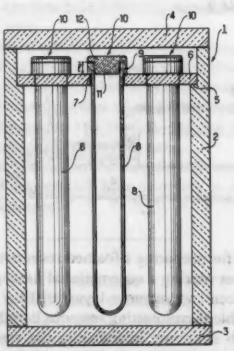
and heating said mixture to a temperature sufficient to crosslink and foam said polyethylene in an area and under conditions which permit expansion of the polyethylene.

4,330,496

METHOD OF SINTERING TUBULAR CERAMIC PARTS

Gerard Desplanches, Palaiseau, and Gerard LeClerc, Thiais, both of France, assignors to Compagnie Generale d'Electricite, Paris, France

Filed Jul. 28, 1980, Ser. No. 173,170
Claims priority, application France, Sep. 11, 1979, 79 22645
Int. Cl.[3] F27B 9/14
U.S. Cl. 264—57 8 Claims



1. A method of making a tubular part of sintered ceramic, the method including forming a tubular part of ceramic material, said tubular part having one open end, placing the part in a sintering chamber, and bringing the chamber up to sintering temperature, wherein the improvement comprises:

during said forming step, imparting an extra thickness to the outer wall of the tubular part for a predetermined length adjacent to the said open end;

inserting a plug into said open end of the tubular part, said plug having a body of predetermined length slidably fitting within, and a shoulder bearing against, said open end of the tubular part; and

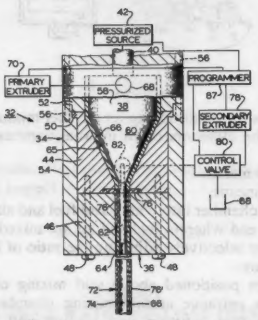
suspending the tubular part substantially vertically within the chamber from a support encircling at least part of the circumference of the tubular member such that the thickened outer wall rests on the support and the other end of the tubular member does not touch the bottom of the chamber, prior to bringing the chamber to sintering temperature, whereby the tubular part is free to shrink during the sintering process wthout distortion.

4,330,497

METHOD OF MAKING GROOVED PLASTIC MEDICAL TUBING

Ronald T. Agdanowski, St. Peters, Mo., assignor to Sherwood Medical Industries Inc., St. Louis, Mo.

Filed Jan. 19, 1981, Ser. No. 226,297
Int. Cl.[3] B29C 17/14
U.S. Cl. 264—150 26 Claims



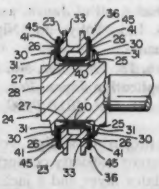
1. A method of making plastic tubing having a selected wall portion thereof with a wall thickness less than that of wall portions adjacent thereto and an opening through that wall portion comprising the steps of coextruding first and second plastic materials so as to form plastic tubing of the first plastic material with the second plastic material in the sidewall of the tubing, the first and second plastic materials being capable of separation after solidification, removing the second plastic material from the tubing to provide tubing having a wall portion of less thickness than wall portions adjacent thereto, and forming an opening through that wall portion.

4,330,498

PEDESTAL LINER FOR A RAILWAY VEHICLE AND METHOD OF MAKING SAME

Donald L. Kleykamp, Springboro, and Peter J. Neroni, Dayton, both of Ohio, assignors to Dayco Corporation, Dayton, Ohio

Division of Ser. No. 30,036, Apr. 13, 1979, Pat. No. 4,239,007.
This application Sep. 2, 1980, Ser. No. 183,126
Int. Cl.[3] B29C 5/00, 27/16, 27/30
U.S. Cl. 264—251 2 Claims



1. In a method of making a U-shaped pedestal liner for a railway vehicle, said liner having a bight portion and a pair of substantially parallel legs extending from said bight portion, the improvement comprising securing a layer of a first polymer having a low friction co-efficient to said bight portion, and securing to said legs a second polymer having a low friction

co-efficient and a different wear characteristic than said first polymer, said first polymer being polyethylene or nylon and said second polymer being ultra high molecular weight polyethylene.

4,330,499

PROCESS AND APPARATUS FOR THE SIMULTANEOUS BIAXIAL STRETCHING OF A PLASTIC FILM

Friedrich F. von und zu Aufsess, Forchheim; Günter Huxhorn, Kirchehrenbach; Hans Pohl, Forchheim, and Wolfgang Sasse, Bubenreuth, all of Fed. Rep. of Germany, assignors to Internationale Octrooi Maatschappij "Octropa" B.V., Rotterdam, Netherlands

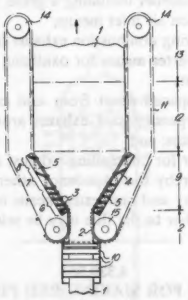
PCT No. PCT/EP79/00098, § 371 Date Jun. 10, 1980, § 102(e) Date Jun. 10, 1980, PCT Pub. No. WO80/01149, PCT Pub. Date Jun. 12, 1980

PCT Filed Dec. 11, 1979, Ser. No. 205,322

Claims priority, application Fed. Rep. of Germany, Dec. 11, 1978, 2853398

Int. Cl.³ B29C *17/02*

U.S. Cl. 264—289.6 **10 Claims**



1. In a process for the biaxial stretching of a flat film web from plastics material in a stretching apparatus in which the edges of the flat film web are retained by grippers driven by means of threaded spindles, and at least part of the stretching in longitudinal direction is being effects by means of a progressive pitch of threaded spindles simultaneously with at least part of the transverse stretching, the modification wherein the film is stretched in longitudinal direction at up to 10% in excess of the stretching degree desired in the finished film and, subsequently to the stretching in longitudinal direction, is shrunk to the desired stretching degree in longitudinal direction, while the film web is still being further stretched in transverse direction, by guiding the grippers in a degressive thread pitch.

5. In an apparatus for the biaxial stretching of a flat film web from a plastics material including grippers which engage the edges of the film web, and threaded spindles for driving the grippers, which have a progressive pitch over at least part of their length, adapted to permit at least part of the stretching in the longitudinal direction to be carried out simultaneously with at least part of the transverse stretching, the modification wherein at the run-off end of the threaded spindles, subsequent to the progressive pitch of the threaded spindles a thread of degressive pitch is provided for the further guiding of the grippers whereby the film can be shrunk in the longitudinal direction while the film web is still being stretched transversely.

4,330,500

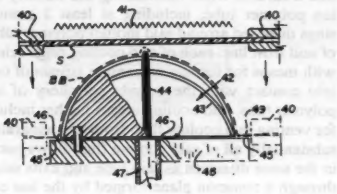
METHODS OF MANUFACTURING DOUBLE-FLANGED WINDOW WELL COVER

Ronald C. Mackes, Crestone, Colo., assignor to B Q P Industries, Inc., Denver, Colo.

Division of Ser. No. 127,972, Mar. 7, 1980. This application May 4, 1981, Ser. No. 260,084

Int. Cl.³ B29C *17/04, 17/14*

U.S. Cl. 264—554 **10 Claims**



1. A method for the manufacture of a double flanged window well cover comprising a bubble formed as a spheroid-like quadrant, a first integral flange at one edge and a second integral flange at the other edge, said second flange being perpendicular to said first flange and said flanges being integral at opposite corners of the bubble, said method including the steps of:

(a) gripping the edges of a sheet of thermoplastic resin in a drawing frame and heating the sheet to a drawing temperature;

(b) drawing the sheet within the frame to a spheroidlike hemisphere, thereby forming a pair of connected opposing bubbles with the undrawn material at the frame adapted to provide said first flange of a window well cover formed from each of the opposing bubbles;

(c) drawing an outstanding double-walled ridge about the transverse equator of the spheroid-like hemisphere; and

(d) separating the connected opposing bubbles at the crest of the ridge and across the undrawn material, whereby the two walls of the ridge provide said second flange of the respective window well covers.

4,330,501

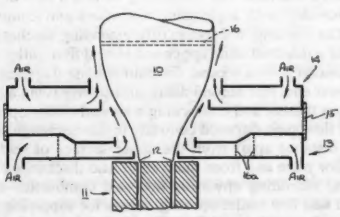
METHOD AND APPARATUS FOR COOLING FILM BUBBLE OF LOW STRAIN HARDENING POLYMERS

David N. Jones, Long Valley, and Stuart J. Kurtz, Martiasville, both of N.J., assignors to Union Carbide Corporation, Danbury, Conn.

Filed Jun. 30, 1980, Ser. No. 164,293

Int. Cl.³ B29D *7/22*

U.S. Cl. 264—566 **27 Claims**



1. A process for cooling a molten tube of a low strain hardening polymer, while maintaining the stability of said molten tube, which comprises contacting the outside periphery of said molten tube with at least two annular streams of cooling fluid from at least two annular cooling rings disposed around said

molten tube and through which said tube advances, wherein substantially all of the cooling fluid flows parallel to and in the same direction as said tube and exits the system through a common plane formed by the last cooling ring through which said tube advances.

17. Apparatus for producing a film tube from a low strain hardening polymer comprising:

means including a die for extruding a molten tube of said polymer; and

means for cooling said molten polymer tube whereby a frost line is formed while maintaining the stability of said molten polymer tube, including at least 2 annular cooling rings disposed around said molten polymer tube upstream of said frost line, each of said cooling rings being provided with means for forcing an annular stream of cooling fluid into contact with the outside periphery of said molten polymer tube, said cooling means further including means for venting said cooling fluid from said apparatus whereby substantially all of said cooling fluid flows parallel to and in the same direction as said tube and exits said apparatus through a common plane formed by the last cooling ring through which said polymer tube advances.

4,330,502

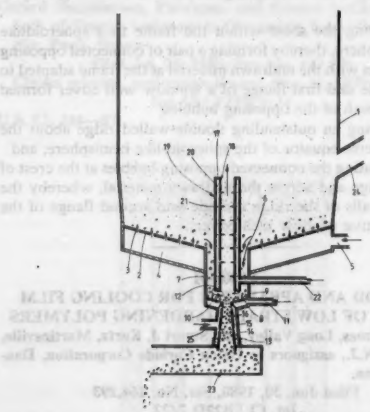
FLUIDIZED BED REACTOR

Folke Engström, Karhula, Finland, assignor to A. Ahlstrom Osakeyhtio, Noormarkku, Finland

Filed Jun. 16, 1980, Ser. No. 159,467

Int. Cl.³ F27B *15/08, 15/16;* B01J *8/30, 8/28*

U.S. Cl. 422—142 **2 Claims**



1. A fluidized bed reactor comprising a housing forming a combustion chamber and containing therein a first distributor plate provided with a plurality of orifices and comprising a first outlet opening, a downwardly extending discharge compartment connected at its upper end to said first outlet opening and provided with a second distributor plate disposed therein at its lower end, said second distributor plate having a plurality of orifices therein and comprising a second outlet opening, an upward flow pipe disposed centrally in the discharge compartment a distance apart from the upper surface of said second distributor plate and from the wall of said discharge compartment and extending upwardly into said combustion chamber through said first outlet opening, means for supplying gas to a first wind box under said first distributor plate, and means for supplying gas to a second wind box located under said second distributor plate, wherein said upward flow pipe is a double-walled pipe, the inner wall of which is provided with openings, means for supplying gas to the space between the walls, a discharge pipe is connected to said second outlet opening, said discharge pipe is provided with openings in its wall and is surrounded by a casing forming a gas space which is connected to a supply source of gas.

4,330,503

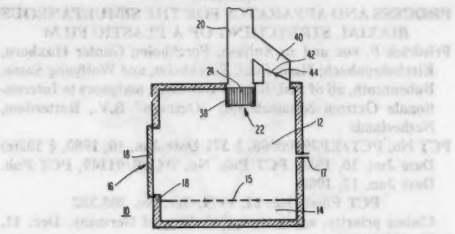
WOOD BURNING STOVE

Roger A. Allaire, Big Flats; William F. Pardue, Jr., and Robert V. VanDewoestine, both of Corning, all of N.Y., assignors to Corning Glass Works, Corning, N.Y.

Filed Jul. 28, 1980, Ser. No. 173,157

Int. Cl.³ F01N *3/15*

U.S. Cl. 422—177 **8 Claims**



1. A wood burning stove comprising:

a combustion chamber including a grate, a side access door and combustion air inlet means;

a flue for removing combustion exhaust from said chamber;

a catalytic converter means for oxidizing oxidizable species in said exhaust;

a passageway spaced apart from said catalytic converter means for bypassing said exhaust around said catalytic converter means; and

a bypass damper for controlling exhaust access to said passageway whereby the impedance otherwise presented to said exhaust by said converter means in exiting the combustion chamber to the flue may be selectively varied.

4,330,504

APPARATUS FOR MAKING RED PHOSPHORUS

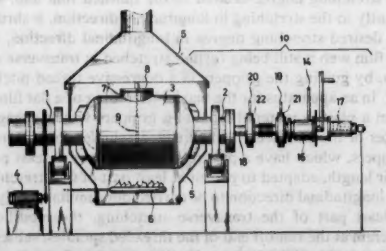
Klaus Lehr, Hürth-Knapsack; Gero Heymer, Erftstadt; Hans-Werner Stephan, Cologne, and Ursus Thümmler, Erftstadt, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Division of Ser. No. 123,106, Feb. 20, 1980, Pat. No. 4,273,752. This application Jan. 19, 1981, Ser. No. 226,468

Claims priority, application Fed. Rep. of Germany, Feb. 23, 1979, 2907059

Int. Cl.³ C01B *25/023*

U.S. Cl. 422—205 **4 Claims**



1. An apparatus for making red phosphorus by subjecting yellow phosphorus to a thermal conversion reaction which comprises: an insulating housing; a drum having a cylindrical portion and two vaulted end portions being filled with ball-

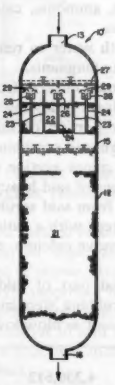
shaped material; two rotatably mounted shafts secured to said end portions, at least one of said shafts being a hollow shaft; said cylindrical portion being formed with an opening closable by means of a cover; the housing surrounding the drum and spaced therefrom; a heating source disposed inside the housing below the drum; a yellow phosphorus dosing feeder connected to one of the hollow shafts, said dosing feeder being comprised of an angled yellow phosphorus feed pipe formed of two tubular structures of which one receives a dosing rod actuatable by means of a piston, the feed pipe being concentrically surrounded by a first jacket and a second double-walled jacket, the two jackets being spaced from said feed pipe and forming an inner gap and outer gap around said feed pipe; the inner gap being provided with an inlet and the outer gap with an outlet permitting water to be circulated therethorough.

4,330,505

HYDROPROCESSING REACTOR WITH EXTENDED OPERATING LIFE

Ramesh Gupta, Chatham Township, Morris County, N.J., assignor to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Dec. 4, 1980, Ser. No. 212,755
Int. Cl.³ B01J *8/04*
U.S. Cl. 422—217 **7 Claims**



1. A reactor for reacting a two phase, gas and liquid mixture in a fixed bed of solids, comprising:

a vessel;

means to introduce both liquid and gas into said vessel;

means to remove both liquid and gas from said vessel;

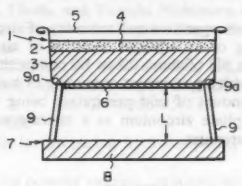
at least one auxiliary bed disposed above said main bed, at least one gas bypass tube for passing gas through said auxiliary bed when said bed becomes fouled and at least one liquid bypass, said liquid bypass comprising a liquid receptacle disposed on top of a hollow unobstructed open tube extending through said auxiliary bed and located directly below said means to introduce liquid into said vessel, said liquid receptacle receiving liquid introduced into said vessel and allowing said liquid to spill over to said auxiliary bed when said auxiliary bed is not fouled, said unobstructed open tube having a flow resistance sufficient to act as a liquid seal against the passage of gas through said liquid bypass tube when said auxiliary bed is not fouled and to provide a low pressure drop bypass for said liquid flowing to said main bed when said auxiliary bed becomes fouled.

4,330,506

THERMOEVAPORATIVE INSECTICIDAL APPARATUS AND A CONTAINER ASSEMBLY USED THEREIN

Yasuharu Takei, Hiroshima, Japan, assignor to Fumakilla Limited, Tokyo, Japan

Filed Feb. 20, 1980, Ser. No. 123,183
Claims priority, application Japan, Feb. 20, 1979, 54-19756; Mar. 27, 1979, 54-38739
Int. Cl.³ A01L *2/00*; A01M *13/00*
U.S. Cl. 422—305 **1 Claim**



1. A thermoevaporative insecticidal apparatus, comprising:

a chemically-reactive heat generating element;

a porous carrier closely fitted to the underside of said heat generating element, the surface of said porous carrier being impregnated with a thermoevaporative insecticidally effective ingredient;

a receiving tray; and

support means connecting said receiving tray and said heat generating element such that said receiving tray is supported below said porous carrier at a distance therefrom of at least one centimeter.

4,330,507

METHOD AND SYSTEM FOR GENERATING AND COLLECTING GALLIUM-68 USING ALKALINE ELUANT

Robert E. Lewis, Milford, N.H., assignor to New England Nuclear Corporation, Boston, Mass.

Filed Jun. 11, 1980, Ser. No. 158,395
Int. Cl.³ G01N *23/12*; C01G *15/00*; A61K *43/00, 49/00*
U.S. Cl. 423—2 **19 Claims**

18. A method for generating an eluate containing Ga-68 in non-complexed ionic form, comprising passing a predetermined quantity of eluant from an eluant container through a generator column containing Ge-68 and Ga-68 to form an eluate, and receiving said eluate in a pre-evacuated eluate collection vial having sufficient vacuum to draw said predetermined quantity of eluant through said column and into the eluate collection vial, said eluant comprising an alkaline solution having a pH in the range of from about 12 to 13.

4,330,508

REMOVAL OF SELENIUM (IV) AND (VI) FROM ACIDIC COPPER SULPHATE SOLUTIONS

Donald R. Weir; Derek G. E. Kerfoot, and Hugh C. Scheie, all of Fort Saskatchewan, Canada, assignors to Sherritt Gordon Mines Limited, Toronto, Canada

Filed Oct. 24, 1980, Ser. No. 200,126
Claims priority, application Canada, Aug. 19, 1980, 358594
Int. Cl.³ C01B *19/04*
U.S. Cl. 423—42 **6 Claims**

1. A process for removing dissolved selenium values from an acid aqueous sulphate solution containing dissolved selenium (IV) values and dissolved selenium (VI) values, the ratio of dissolved selenium (IV) values to dissolved selenium (VI) values being at least 3:1, comprising passing said solution through a tubular member in a plug flow manner and injecting into the solution, as the solution enters the tubular member, a selenium-reducing compound selected from the group consisting of sulphur dioxide and a sulphite solution to reduce the

concentrations of dissolved selenium (IV) values and dissolved selenium (VI) values to satisfactory low levels by production of a selenium-containing precipitate.

4,330,509

SEPARATION OF ZIRCONIUM AND URANIUM

Helen G. Henry, Reno, Nev., assignor to The United States of America as represented by the Secretary of the Interior, Washington, D.C.

Filed May 22, 1981, Ser. No. 266,225
Int. Cl.³ C01G *25/00*
U.S. Cl. 423—85 **4 Claims**

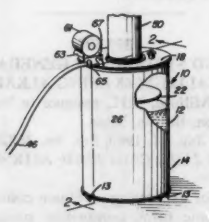
1. A method for separation and recovery of zirconium from a feed consisting of an aqueous solution of zirconium and uranium having a pH of about 0.2 to 1.0 comprising treatment of the solution with a precipitant consisting of tartaric acid or a tartrate, the amount of said precipitant being sufficient to selectively precipitate zirconium as a tartrate with minimal precipitation of uranium.

4,330,510

METHOD FOR CLEANSING NOXIOUS CONSTITUENTS FROM GAS STREAMS

John M. Schauer, 143rd St., R.R. 5, Lockport, Ill. 60441, and Dennis J. Schauer, 305 S. May St., Joliet, Ill. 60436

Division of Ser. No. 890,988, Mar. 28, 1978, Pat. No. 4,251,485, which is a continuation-in-part of Ser. No. 732,432, Oct. 14, 1976, abandoned, which is a continuation-in-part of Ser. No. 629,617, Nov. 5, 1975, abandoned. This application Sep. 7, 1979, Ser. No. 73,437
Int. Cl.³ B01D *53/34*
U.S. Cl. 423—210 **12 Claims**



1. A method of scrubbing noxious gas from a gas stream which comprises:

(a) filling a closed upstanding container having a bottom, a side wall, and a top cover with a gas washing liquid to a predetermined level, said container having a baffle plate mounted substantially horizontally in said container above said predetermined liquid level and being spaced from said side wall of said container about at least substantially the entire periphery of said baffle plate to permit cleansed gas to escape, the space between said baffle plate and said gas washing liquid being substantially unobstructed, said baffle plate having a surface facing said liquid in the lower portion of said container as gas is driven therethrough and to act as an impact wall against which gas-containing bubbles impinge;

(b) pumping a gas to be processed into at least one drive pipe having an inlet positioned outside of said container and extending into said container with an outlet near the bottom of said container appreciably below said predetermined liquid level to direct said gas stream substantially vertically into the bottom of said container and to form gas-containing bubbles in said gas washing liquid;

(c) discharging cleansed gas escaping around the periphery of said baffle plate from said container through an outlet stack, said outlet stack communicating with the interior of said container above said baffle plate; and

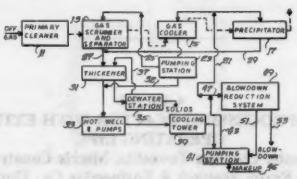
(d) impacting said gas-containing bubbles against said baffle plate to cause said gas-containing bubbles to recirculate through said liquid before passing outwardly around the periphery of said baffle plate.

4,330,511

TREATMENT OF BLAST FURNACE OFF-GAS

Theodore W. Nelson, Jr., Glen Ellyn; David B. Corkle, River Forest; Joel Z. Wolfe, Bloomingdale, and Larry A. Ganzel, Western Springs, all of Ill., assignors to Peter F. Loftus Corporation (Illinois), Chicago, Ill.

Filed Mar. 17, 1980, Ser. No. 131,066
Int. Cl.³ B01D *53/34*; C21B *7/22*
U.S. Cl. 423—210 **17 Claims**



1. A method for treating off-gas produced by a blast furnace containing particulate solids and water-soluble contaminants including heavy metals, ammonia, calcium and magnesium, which method comprises

scrubbing the gas with water to remove particulate solids and dissolve said contaminants,

settling solids from liquid effluent from said scrubbing,

cooling the liquid effluent following said settling,

recirculating a major portion of said cooled effluent for another pass through said scrubbing step,

chemically treating a minor portion of said cooled effluent and precipitating ions of said heavy metals as sludge,

treating said effluent from said scrubbing, settling, cooling and precipitating steps with a cation exchange resin in a sodium cycle to remove calcium, magnesium and ammonium ions, and

returning a substantial part of said ion-exchange-treated effluent to said scrubbing step and discharging another substantial part thereof as blowdown.

4,330,512

METHODS FOR TREATING A GAS FLOW CONTAINING SULFUR OXIDE

Olle B. Lindstrom, Lorensviksv 14, S-18363 Taby, Sweden

Continuation of Ser. No. 772,562, Feb. 28, 1977, abandoned. This application Dec. 12, 1980, Ser. No. 215,875
Claims priority, application Sweden, Feb. 26, 1976, 7602575
Int. Cl.³ C01B *17/00*; B01J *8/00*
U.S. Cl. 423—244 **5 Claims**

1. A process for treating a gas flow in the form of stack gases containing a sulphur oxide, said process comprising the steps of:

conducting the gas upwardly within a chimney-like element defining a contact zone, and

treating said gas with an agent disposed on contact elements in the form of balls located in the contact zone, the volume of the agent being less than the volume of the contact elements, said treating step including releasing said contact elements in said contact zone for free and uniform downward falling movement through the rising gas flow such that all of said elements fall freely and uniformly downwardly through the rising gas flow in a path limited solely by upright side walls of the contact zone, whereby the average distance which said contact elements travel

relative to the gas flow between collisions is at least five times the longest dimension of said contact elements, said elements being released at a rate such that the total volume of the contact elements is less than 20% of the volume of the contact zone.

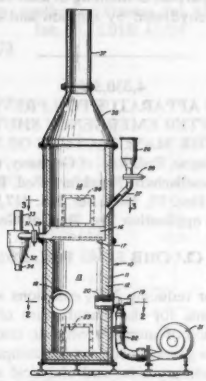
4,330,513
CATALYTIC FUME INCINERATION

William K. Hunter, Kildeer; Leslie C. Hardison, Barrington, and Edward J. Dowd, Palatine, all of Ill., assignors to Air Resources, Inc., Palatine, Ill.

Continuation of Ser. No. 12,325, Feb. 15, 1979, abandoned, which is a continuation of Ser. No. 731,987, Oct. 13, 1976, abandoned. This application Dec. 11, 1980, Ser. No. 215,322

Int. Cl.³ B01D *53/36*

U.S. Cl. 423—245 **10 Claims**



1. A process for the catalytic incineration of an industrial waste gas containing organic emissions or other combustible materials, comprising:

providing an elongated vertical reactor having a lower zone containing a burner, an upper zone, a vertically unrestrained catalyst bed of coarse, attrition-resistant, particulate oxidation catalyst supported in said reactor between said lower and upper zones, catalyst addition means for introducing fresh catalyst to said upper zone above said bed, and catalyst withdrawal means for removing used catalyst from said bed;

said catalyst comprising an effective amount of chromic oxide and a carrier or support and having a particle size within the range of from about 500 microns to about ¼ inch and said bed having a static depth of from about 2 to 24 inches;

introducing the gas into said lower zone and preheating the gas therein by said burner;

passing the preheated gas at a temperature of from about 500° F. to about 1000° F. upwardly from said lower zone through said catalyst bed to said upper zone;

regulating the upward flow of said gas through said catalyst bed to achieve a face velocity within the range of about 1 to about 10 standard cubic feet per second per square foot and a pressure drop across said catalyst bed of less than 1 pound per square inch, said velocity being sufficient to agitate or fluidize said catalyst bed but insufficient to cause any substantial transfer of catalyst particles out of said reactor, the upward flow of said gas being the sole means of effecting agitation or fluidization of said bed; and

discharging the treated gas from said upper zone without separation of catalyst therefrom, the hardness and attrition resistance of said catalyst being such that the loss of catalyst fines in the treated gas discharged from said upper zone is less than one pound per million standard cubic feet of gas treated;

the activity of said catalyst bed being maintainable by feeding fresh catalyst to said upper zone above said bed by said catalyst addition means and by removing used catalyst from said bed by said catalyst withdrawal means, without interrupting the operation of the process.

4,330,514
HYDROXYAPATITE, CERAMIC MATERIAL AND PROCESS FOR PREPARING THEREOF

Hirosi Nagai, Chofu, and Yasushi Nishimura, Tokyo, both of Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 19, 1980, Ser. No. 188,832

Claims priority, application Japan, Sep. 25, 1979, 54-123000

Int. Cl.³ C01B *25/32*

U.S. Cl. 423—309 **4 Claims**

1. A process for preparing hydroxyapatite, comprising the steps of,

(a) converting powder calcium carbonate into calcium oxide by thermal decomposing in an inert atmosphere at a temperature of 800° to 1300° C. for 0.5 to 10 hours,

(b) cooling the converted calcium oxide to a temperature lower than 500° C. in the inert atmosphere,

(c) slaking the cooled calcium oxide with water while agitating in turbulent flow in an inert atmosphere thereby to obtain calcium hydroxide,

(d) bringing the obtained calcium hydroxide into reaction with an aqueous solution of phosphoric acid in an inert atmosphere under turbulent flow, thereby to obtain hydroxyapatite.

4,330,515
PREPARATION OF PHOSPHOROUS ACID FROM INDUSTRIAL WASTE MATERIAL CONTAINING PHOSPHITES

Donald H. Campbell, Niagara-on-the-Lake, Canada, and Edward J. Quinn, East Amherst, N.Y., assignors to Hooker Chemicals & Plastics Corp., Niagara Falls, N.Y.

Filed Dec. 18, 1980, Ser. No. 217,631

Int. Cl.³ C01B *25/16*

U.S. Cl. 423—316 **7 Claims**

1. A process for the preparation of phosphorous acid from phosphite industrial wastes comprising: dispersing the waste materials in an aqueous solution of phosphorous acid, removing the undissolvable portion, adding a strong mineral acid to react with the cations present to cause precipitation, and collecting the phosphorous acid produced.

4,330,516
DECOLORIZATION AND PURIFICATION OF CRUDE WET-PROCESS PHOSPHORIC ACID

Louis Winand, Bourg Achard, France, assignor to Rhone-Poulenc Industries, Paris, France

Filed Nov. 3, 1980, Ser. No. 203,490

Claims priority, application France, Nov. 20, 1979, 79 28530

Int. Cl.³ E01B *25/16*

U.S. Cl. 423—321 S **32 Claims**

1. A process for the purification/decolorization of crude wet-process phosphoric acid prepared by mineral acid acidulation of uncalcined phosphate rock and containing contaminating amounts of organic impurities, which process comprises (i) preliminarily decolorizing such crude acid with activated carbon, (ii) liquid-liquid extracting the resultant predecolorized acid with an essentially water-insoluble organic extractant, (iii) back-extracting the extracted phosphoric acid with an aqueous phase to afford an aqueous phosphoric acid solution, (iv) concentrating the resultant back-extracted aqueous phosphoric acid solution to a content by weight of P_2O_5 in excess of 50% by heating at elevated, coloration-developing temperatures, and (v) then subjecting the resultant concentrated solu-

tion to a final decolorization by heating with a strong oxidant, an adsorbent, or both, to afford a purified, essentially colorless phosphoric acid solution having a coloration of 10 Apha or less.

4,330,517

DEFLUORINATION OF WET PROCESS PHOSPHORIC ACID

Dennis H. Michalski, Lakeland, Fla., assignor to International Minerals & Chemical Corp., Terre Haute, Ind.

Filed Mar. 27, 1981, Ser. No. 248,097
Int. Cl.³ C01B *25/16*
U.S. Cl. 423—321 R **6 Claims**

1. In a method of defluorinating phosphoric acid, in which concentrated wet process phosphoric acid is heated to boiling in the presence of silica to form water vapor and silicon tetrafluoride, the improvement comprising the step of contacting the phosphoric acid with an aqueous suspension comprising at least about 11% solids of a silica-containing dust collected as fume from silicon and silicon metal alloy furnace operations, said dust having a dry bulk density of less than about 10 lbs/ft^3, and a silica content of at least about 60% by weight.

4,330,518

REMOVAL OF CONTAMINANTS FROM ZEOLITE MOTHER LIQUORS

John A. Kostinko, Bel Air, Md., assignor to J. M. Huber Corporation, Locust, N.J.

Continuation-in-part of Ser. No. 88,243, Oct. 25, 1979, abandoned, which is a continuation-in-part of Ser. No. 971,584, Dec. 20, 1978, Pat. No. 4,235,856. This application Sep. 16, 1980, Ser. No. 187,652
Int. Cl.³ C01B *33/28*
U.S. Cl. 423—329 **1 Claim**

1. In a process of producing zeolite A by the steps of mixing a sodium aluminate solution and a sodium silicate solution to produce a reaction mixture comprising a mother liquor containing chloride and carbonate contaminants and an amorphous sodium aluminosilicate; continuing said reaction to form a zeolite composition containing zeolite A; recovering said zeolite A composition from said reaction mixture; and recycling said mother liquor to said reaction mixture;

the improvement comprising: heating said zeolite A while contained in said reaction mixture at a temperature of 120° to 140° C. for a sufficient time to convert a sufficient portion of the zeolite A to a sodalite type product which reduces the chloride and carbonate ion levels in said mother liquor by forming compounds containing these ions; and recovering said sodalite type product from said reaction mixture as part of the zeolite composition prior to recycling said mother liquor.

4,330,519

NOVEL AMORPHOUS SILICA

Akira Takahashi, and Toru Takikawa, both of Gifu, Japan, assignors to Kabushiki Kaisha Osaka Packing Seizosho, Osaka, Japan

Division of Ser. No. 920,204, Jun. 29, 1978, Pat. No. 4,230,765, which is a continuation of Ser. No. 670,543, Mar. 25, 1976, abandoned. This application Jul. 22, 1980, Ser. No. 171,163
Claims priority, application Japan, Mar. 25, 1975, 50-36298; Mar. 25, 1975, 50-36299; Mar. 25, 1975, 50-36300
The portion of the term of this patent subsequent to Oct. 28, 1997, has been disclaimed.
Int. Cl.³ C01B *33/12*
U.S. Cl. 423—335 **3 Claims**

1. An amorphous silica particle in the form of a substantially globular secondary particle having a diameter of about 10 to about 150μ, a surface area of 250–600 m^2/g and an oil absorption of 500–1200 cc/100 g, and composed of numerous primary particles of amorphous silica randomly three-dimensionally interlocked with one another and voids interspersed therebetween;

(a) each of the primary particles having a crystalline appearance of calcium silicate crystal and at least two surfaces in symmetric relation, and having:

(i) a length of about 1 to about 50μ and a thickness of about 100 A to about 0.5μ, the length being about 10 to about 5,000 times the thickness when the calcium silicate crystal is xonotlite crystal, tobermorite crystal or gyrolite crystal, or

(ii) a length of about 1 to about 20μ and a thickness of about 50 to about 500 A, the length being about 50 to about 5,000 times the thickness when the calcium silicate crystal is CSHn crystal,

(b) the calcium silicate crystal being one member selected from the group consisting of xonotlite crystals, tobermolite crystals, gyrolite crystals and CSHn crystals; and

(c) the primary particle containing at least 98% by weight of SiO_2 when dehydrated by ignition and chemically analyzed.

4,330,520

PROCESS AND APPARATUS FOR PREVENTING NO_x EMISSIONS AFTER EMERGENCY SHUTDOWNS OF PLANTS FOR THE MANUFACTURE OF NITRIC ACID

Günter Roller, Cologne, Fed. Rep. of Germany, assignor to Davy McKee Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Filed Dec. 17, 1980, Ser. No. 217,541
Claims priority, application Fed. Rep. of Germany, Dec. 18, 1979, 2950872
Int. Cl.³ C01B *21/40*; F01L *25/00*
U.S. Cl. 423—392 **29 Claims**

1. A process for reducing NO_x emissions after emergency shutdowns of plants for the manufacture of nitric acid by catalytic combustion of ammonia with air, compression of the nitrous combustion gases in a nitrous gas compressor having an intake side and delivery side, and chemical and/or physical absorption of the nitrous gases from the gas stream, comprising the steps of:

immediately upon such emergency shutdown—

(a) interrupting the nitrous gas supply to the intake side of the nitrous gas compressor;

(b) conveying the nitrous gases which are on the intake side through the nitrous gas compressor to the delivery side;

(c) shutting off the gas volume is on the delivery side of the nitrous gas compressor thereby establishing shutoff pressure sections; expanding the volume of gas existing in the nitrous gas compressor to the intake side of the compressor; and drawing off by suction the gas volume which is then on the intake side into a vacuum system;

and thereafter—

(d) drawing off acid which is charged with NO_x and is in the chemical and/or physical absorption stages;

(e) circulating degassed acid through the chemical and/or physical absorption stages; and

(f) after establishing equilibrium in the chemical and/or physical absorption stages, expanding the gases in the shutoff pressure section downstream of the absorption stages while simultaneously charging said absorption stages with cooled acid.

17. Apparatus for reducing NO_x emissions after an emergency shutdown of a plant for the manufacture of nitric acid, which plant includes a combustion unit for the combustion of ammonia to produce nitrous gas, cooling stages for the nitrous gas, a nitrous gas compressor having an intake side and a delivery side, columns for chemical and/or physical absorption of the nitrous gases, and a tail gas turbine, wherein the improvement comprises:

(a) means for interrupting the nitrous gas supply to the intake side of the nitrous gas compressor;

(b) means for providing a run-on time of the nitrous gas compressor after the emergency shutdown which is sufficient to convey substantially all of the volume of the

nitrous gas from the intake side of the compressor to the delivery side;

(c) means for shutting off the gas volume which is on the delivery side of the nitrous gas compressor;

(d) means for expanding the gas volume existing in the nitrous gas compressor to the intake side of the compressor; and

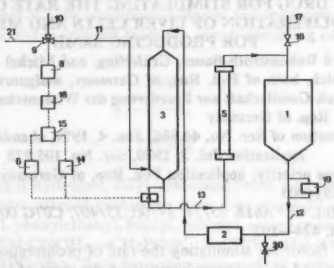
(e) a vacuum system and suction means for drawing off the gas volume on the intake side of the compressor into the vacuum system.

4,330,521

PROCESS FOR THE MANUFACTURE OF AQUEOUS SOLUTIONS OF ALKALI METAL HYPOCHLORITE

Willy Glineur, Brussels, Belgium, assignor to Solvay & Cie, Brussels, Belgium

Filed Jul. 9, 1980, Ser. No. 167,132
Claims priority, application France, Jul. 16, 1979, 79 18548
Int. Cl.³ C01B *11/04*
U.S. Cl. 423—473 **4 Claims**



1. In a process for the manufacture of aqueous solutions of alkali metal hypochlorite, wherein chlorine is reacted with an aqueous solution of alkali metal hydroxide and wherein the concentrations and amounts of the mixture of said alkali metal hydrochlorite, chlorine and alkali metal hydroxide vary with time and said amounts of chlorine and alkali metal hydroxide are regulated to maintain a slight predetermined alkalinity in the mixture to prevent decomposition of said alkali metal hypochlorite, said regulation being performed by measurements of the redox potential of said mixture, conversion of said redox potential into a signal representative of the derivative of said redox potential relative to time, and regulation by said signal of the addition of at least one of said chlorine and alkali metal hydroxide, the improvement which comprises converting said redox potential into a signal representative of either said potential itself or its antilogarithm, multiplying said signal representative of the derivative of said redox potential relative to time by said signal representative of either said redox potential itself or its antilogarithm, and regulating said addition of at least one of said chlorine and alkali metal hydroxide in order that the the signal resulting from the multiplication be maintained within a predetermined range.

4,330,522

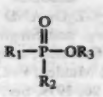
ACID GAS SEPARATION

Charles A. Lieder, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Dec. 22, 1980, Ser. No. 218,604
Int. Cl.³ C01B *17/05*; B01D *53/34*
U.S. Cl. 423—573 G **17 Claims**

4. A process for the removal of H_2S and CO_2 from a sour gaseous stream comprising:

(a) contacting the sour gaseous stream in a contacting zone with an absorbent mixture comprising an liquid absorbent having the formula



wherein R_1, R_2, and R_3 may be the same or different, and are alkyl containing 1 through 4 carbon atoms, and an effective amount of a reactant selected from polyvalent metallic ions and polyvalent metal chelate compounds, and mixtures thereof, to produce a sweet gas stream and an absorbent admixture containing absorbed CO_2, sulfur, and a reduced reactant;

(b) removing at least a portion of the sulfur from the absorbent admixture;

(c) stripping the absorbent admixture in a stripping zone with oxygen to produce CO_2 and a regenerated reactant;

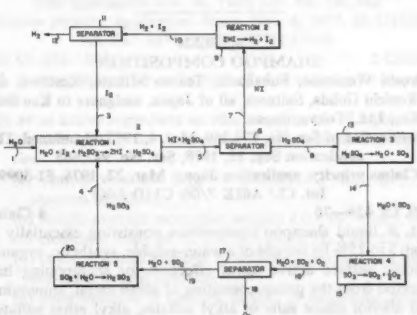
(d) returning the absorbent admixture from the stripping zone to the contacting zone of step A.

4,330,523

DECOMPOSITION OF WATER

Lee E. Brecher, North Huntingdon, and Christopher K. Wu, Wilkins Township, Allegheny County, Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Continuation of Ser. No. 661,072, Feb. 25, 1976, abandoned. This application Jan. 29, 1979, Ser. No. 7,459
Int. Cl.³ C01B *1/02, 13/00*; B01J *7/00*
U.S. Cl. 423—579 **10 Claims**



1. A method of decomposing water into hydrogen and oxygen comprising:

(1) reacting iodine with said water and sulfurous acid to produce hydrogen iodide and sulfuric acid;

(2) decomposing said hydrogen iodide to produce said hydrogen and said iodine;

(3) decomposing said sulfuric acid to produce water and sulfur trioxide by reacting said sulfuric acid with a metal oxide of a metal which forms a sulfate to produce water and said sulfate, and decomposing said sulfate to produce said metal oxide and said sulfur trioxide;

(4) decomposing said sulfur trioxide to produce sulfur dioxide and said oxygen; and

(5) reacting said sulfur dioxide with water to produce said sulfurous acid.

4,330,524

CRYSTALLINE $BI_2GE_3O_9$ AND ITS PREPARATION

Christa Grabmaier, Berg, and Siegfried Haussühl, Cologne, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Dec. 20, 1979, Ser. No. 105,947

Claims priority, application Fed. Rep. of Germany, Jan. 17, 1979, 2901669

Int. Cl.³ C01G *17/00, 29/00*

U.S. Cl. 423—593 2 Claims

1. In a bismuth-germanium oxide material having an emperical formula $Bi_2 Ge_3 O_9$, the improvement comprising wherein said material is a single-phase chemical compound in monocrystalline form and exhibits a double lattice spacing, 2d, of 10.572Å in the [001]-crystal direction.

2. A method of producing the monocrystalline compound defined in claim 1 comprising providing a melt containing pure $Bi_2 O_3$ and $Ge O_2$ in a molecular ratio, like in the monocrystalline compound, of 1:3 and drawing a monocrystal therefrom via the Czochralski technique.

4,330,525

PROCESS FOR THE PRODUCTION OF DEAD BURNED REFRACTORY MAGNESIA

Jack B. Reynolds, Midland, and Charles R. Amos, Auburn, both of Mich., assignors to The Dow Chemical Co., Midland, Mich.

Continuation-in-part of Ser. No. 960,382, Nov. 13, 1978, Pat. No. 4,243,424. This application Dec. 29, 1980, Ser. No. 220,949

The portion of the term of this patent subsequent to Jan. 6, 1998, has been disclaimed.

Int. Cl.³ C01F *5/08*

U.S. Cl. 423—636 16 Claims

1. In a method for producing a sintered, high density, dead burned, refractory magnesia from an aqueous slurry of magnesium hydroxide, the improvement comprising simultaneously thermally dehydrating and mechanically working said aqueous slurry with a compressive-shearing force to form coherent compacts of magnesium hydroxide containing about 75 to about 85 percent by weight solids.

4,330,526

SHAMPOO COMPOSITION

Hiroshi Watanabe, Funabashi; Tsuruo Mikata, Kashiwa, and Kenichi Gohda, Saitama, all of Japan, assignors to Kao Soap Co., Ltd., Tokyo, Japan

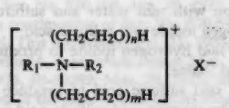
Continuation of Ser. No. 774,269, Mar. 4, 1977, abandoned. This application Sep. 15, 1978, Ser. No. 942,665

Claims priority, application Japan, Mar. 22, 1976, 51-30996

Int. Cl.³ A61K *7/06;* C11D *3/48*

U.S. Cl. 424—70 4 Claims

1. A liquid shampoo composition consisting essentially of from 5 to 25% by weight of a water-soluble, synthetic, organic, anionic surface active agent effective for shampooing hair selected from the group consisting of alkali metal, ammonium and alkylol amine salts of alkyl sulfates, alkyl ether sulfates, alkyl sulfonates, alkyl benzene sulfonates and α-olefin sulfonates, from 0.1 to 5.0% by weight of a cationic surface active agent having the formula (I):



(I)

wherein R_1 is alkyl having 16 to 22 carbon atoms, R_2 is methyl, ethyl or alkyl having 16 to 22 carbon atoms, X is halogen, methyl sulfate or ethyl sulfate, and m and n each is a number of at least one and the sum of n and m is in the range of from 5 to 30,

from 0.1 to 3.0% by weight of oleic acid monoglyceride, and the balance is essentially water.

4,330,527

WOUND TREATMENT AGENT

Teruo Arima, No. 53-10, 6-chome, Tsukaguchi-cho, Amagasaki-shi, Hyogo-ken; Kenji Machii, No. 4-45-404, 3-chome, Takabedai, Tondabayashi-shi, Osaka-fu; Nobumoto Chikazawa, No. 5016-29, Nakamachi, Nara-shi; Tetsuya Takeuchi, No. 7-7, Tsukumodai, Suita-shi, Osaka-fu, and Setsuro Fujii, No. 4-27-131, 1-chome, Nishimidorigaoka, Toyonaka-shi, Osaka-fu, all of Japan

Filed Nov. 13, 1979, Ser. No. 93,530

Int. Cl.³ A61K *37/48*

U.S. Cl. 424—94 12 Claims

1. A wound treatment preparation comprising: an effective wound treating amount of nucleoside phosphotransferase produced by a nucleoside phosphotransferase producing bacterium of the genus clostridium as the effective ingredient and a pharmaceutically acceptable topical carrier.

2. A wound treatment preparation according to claim 1, and further including an effective amount of zinc oxide.

4,330,528

DRUG FOR STIMULATING THE RATE OF PROLIFERATION OF LIVER CELLS AND METHOD FOR PRODUCING SAME

Gerhard Ruhenstroth-Bauer, Gräfelfing, and Michel Goldberg, Munich, both of Fed. Rep. of Germany, assignors to Max-Planck-Gesellschaft zur Foerderung der Wissenschaften E.V., Fed. Rep. of Germany

Continuation of Ser. No. 44,886, Jun. 4, 1979, abandoned. This application Jul. 3, 1980, Ser. No. 105,923

Claims priority, application Fed. Rep. of Germany, Apr. 12, 1979, 2914903

Int. Cl.³ A61K *35/14, 37/00, 35/407;* C07G *00/00*

U.S. Cl. 424—101 3 Claims

1. A factor for stimulating the rate of proliferation of liver cells formed by a process comprising the steps of

providing a quantity of blood plasma of normal animals,

acidifying said blood plasma to a pH level of 5.5,

heat denaturing said acidified plasma at a temperature of approximately 95° C.,

centrifuging said acidified and heat denatured blood plasma to remove the denatured proteins from the plasma, and

treating the supernatant from said centrifugation with a peptide-peptidyl-hydrolase to obtain said factor, said factor being a neuraminic-acid-free and betagalactose-free peptide with a molecular weight of approximately 1200 D.

4,330,529

ANTIBACTERIAL COMPOSITION

Hiroshi Imanaka, Osaka, and Minoru Nishida, Kyoto, both of Japan, assignors to Fujisawa Pharmaceutical Co., Ltd., Osaka, Japan

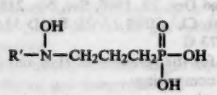
Continuation-in-part of Ser. No. 66,314, Aug. 14, 1979, which is a continuation-in-part of Ser. No. 942,364, Sep. 14, 1978, Pat. No. 4,210,635, which is a continuation-in-part of Ser. No. 877,944, Feb. 15, 1978, Pat. No. 4,196,193. This application Sep. 29, 1980, Ser. No. 192,437

Claims priority, application Japan, Feb. 9, 1979, 54/14568; European Pat. Off., Feb. 14, 1979, 79100446.8; Japan, Sep. 13, 1979, 54/118650; European Pat. Off., Sep. 13, 1979, 79103432.5

Int. Cl.³ A61K *35/00*

U.S. Cl. 424—114 3 Claims

1. An antibacterial composition comprising a phosphonic acid derivative of the formula:



wherein R' is formyl, or its pharmaceutically acceptable salt and a cephalosporin selected from the group consisting of

cefazolin, cephalexin and their pharmaceutically acceptable salts, wherein the phosphonic acid derivatives and the cephalosporin are contained in the composition in a ratio of 1:4 to 4:1.

4,330,530

ANTI-ARTHRITIC COMPOSITIONS AND METHOD USING GOLD SALTS AND ORGANOPHOSPHONATES

Bennie L. Baker, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed Dec. 22, 1980, Ser. No. 219,052
Int. Cl.[3] A61K *31/28, 31/66, 33/24*
U.S. Cl. 424—131 4 Claims

1. A method for treating arthritic conditions comprising administering to a human or animal in need of such treatment a safe and effective amount, not less than about 200 mg. per day, of an organophosphonate compound and a safe and effective amount, within the range from about 5 to about 200 mg. per week, of a pharmaceutically-acceptable gold salt useful in the treatment of such conditions, wherein the organophosphonate compound is selected from the group consisting of

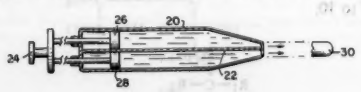
wherein R_3 is hydrogen, alkyl containing from 1 to about 20 carbon atoms, alkenyl containing from 2 to about 20 carbon atoms, aryl, phenylethenyl, benzyl, halogen, amino, substituted amino, $-CH_2COOH$, $-CH_2PO_3H_2$, $-CH(PO_3H_2)(OH)$, or $-CH_2CH(PO_3H_2)_2$; R_4 is hydrogen, lower alkyl, amino, benzyl, halogen, hydroxyl, $-CH_2COOH$, $-CH_2PO_3H_2$, or $-CH_2CH_2PO_3H_2$, and the pharmaceutically-acceptable salts thereof, and wherein the gold salt is selected from the group consisting of gold sodium thiomalate, gold sodium thiosulfate, triethylphosphine gold, gold sodium thioglucose and mixtures thereof.

4,330,531

GERM-KILLING MATERIALS

Howard Alliger, 10 Ponderosa Dr., Melville, N.Y. 11476

Continuation of Ser. No. 896,724, Apr. 17, 1978, abandoned, which is a continuation-in-part of Ser. No. 670,674, Mar. 26, 1976, Pat. No. 4,084,747. This application Jun. 20, 1980, Ser. No. 161,336
Int. Cl.[3] A61K *33/20, 7/20*
U.S. Cl. 424—149 5 Claims



1. In a germ-killing skin medication adapted for treatment of skin diseases such as acne and burns comprising two gels adapted to be simultaneously applied and mixed in situ and to adhere on the skin or lesion surface to be treated, including the treatment of burns as well as acne, the improvement comprising said first get being an aqueous gel comprising sodium chlorite and said second gel being an aqueous gel comprising lactic acid, there being sufficient of said lactic acid to lower the pH of said medication to less than about 7.

4,330,532

ANGIOTENSIN-II ANALOGUES WITH ANTAGONIZING EFFECTS, CONTAINING AN α-HYDROXYCARBOXYLIC ACID RESIDUE IN POSITION 8, AND A PROCESS FOR THE PREPARATION THEREOF

Olga Nyeki; Lajos Kisfaludy; Egon Karpati, and Laszlo Szporny, all of Budapest, Hungary, assignors to Richter Gedeon Vegyeszeti Gyar Rt., Budapest, Hungary

Filed Jan. 6, 1981, Ser. No. 222,765
Claims priority, application Hungary, Jan. 18, 1980, 100/80
Int. Cl.[3] A61K *37/00;* C07C *103/52*
U.S. Cl. 424—177 5 Claims

1. An octapeptide of angiotensin-II antagonizing effects having the formula (I),

X-Arg-Val-Tyr-Ile-His-Pro-Y-OA (I)

wherein

X is sarcosyl,

Y is a residue of lactic acid or L-2-hydroxy-3-methylvaleric acid, and

A is hydrogen or a C_{1-5} alkyl group,

or a phamaceutically acceptable acid addition salt or complex thereof.

4,330,533

NOVEL POLYSACCHARIDE AND HYPOCHOLESTEROL COMPOSITION CONTAINING THE SAME

Yoshihiro Takayama; Fujio Endo; Tsuneo Nozawa; Yoshiro Masuda; Motokuni Mori, and Toshiji Kanayama, all of Ami, Japan, assignors to Mitsubishi Petrochemical Co., Ltd. and Mitsubishi Yuka Pharmaceutical Co., Ltd., both of Tokyo, Japan

Division of Ser. No. 920,142, Jun. 29, 1978, Pat. No. 4,230,800. This application Apr. 24, 1980, Ser. No. 143,442
Claims priority, application Japan, Nov. 8, 1977, 52-133104
Int. Cl.[3] A61K *31/71;* C07H *37/00*
U.S. Cl. 424—181 2 Claims

2. A composition for reduction of cholesterol which comprises

(i) as an active ingredient an effective amount of a polysaccharide having the following physico-chemical properties:

(a) optical rotation: $[\alpha]_D^{20} = +48.4° \pm 3.3°$ (0.1 w/v % aqueous solution);

(b) weight average molecular weight: $2.0 \times 10^5 - 2.0 \times 10^6$;

(c) elemental analysis: C, 37.7%±3.0%; H, 5.8%±0.5%;

(d) color reaction: positive in anthrone reaction and phenol-sulfuric acid reaction;

(e) determination of basicity, acidity or neutrality: acidic polysaccharide;

(f) infrared absorption spectrum: characteristic absorption bands (cm^{-1}) at 3450(S), 2940(M), 1620(M), 1400(M), 1040(S) and 890(W);

(g) solubility: soluble in water IN hydrochloric acid, IN sulfuric acid and IN aqueous ammonia; insoluble in ethanol, ether, acetone, chloroform and dimethyl sulfoxide;

(h) viscosity: 1000–3000 cps measured on its 1.0 w/v % aqueous solution at 20° C. by means of BL-type viscometer (manufactured by Tokyo Keiki K. K., Japan);

(i) sugar units: spots of glucose and mannose on paper chromatography after hydrolysis and sugar unit ratio of glucose to mannose of 3:2 by gas chromatography; and

(j) color and shape: white and amorphous as such and colorless in its aqueous solution; and

(ii) a pharmaceutically acceptable carrier.

4,330,534

N^4-ACYLCYTOSINE ARABINOSIDE COMPOSITIONS

Yoshio Sakurai, Mitaka; Tateshi Kataoka, Tokyo, and Fujiko Oh-hashi, Kounosu, all of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Japan

Filed Jul. 16, 1980, Ser. No. 169,422
Claims priority, application Japan, Aug. 2, 1979, 54/98075
Int. Cl.³ A61K *31/70;* C07H *19/08;* A61K *31/705*
U.S. Cl. 424—182 3 Claims

1. A N^4-acylcytosine arabinoside composition which consists essentially of (a) a liposome of lecithin and (b) a N^4-acylcytosine arabinoside having a C_{6-18} aliphatic acyl group encapsulated in the liposome, said composition containing no substantial amount of stearylamine or dicetyl phosphate.

2. The N^4-acylcytosine arabinoside composition of claim 1, wherein the liposome of lecithin contains cholesterol.

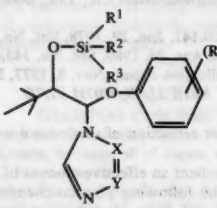
4,330,535

FUNGICIDAL AZOLYL-SILYL-GLYCOL ETHERS, THEIR USE FOR COMBATING FUNGI, AND AGENTS THEREFOR

Rolf-Dieter Acker, Leimen; Ernst Buschmann, Ludwigshafen; Sabine Thym, Dossenheim; Bernd Zeeh, Ludwigshafen, and Ernst-Heinrich Pommer, Limburgerhof, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Dec. 8, 1980, Ser. No. 213,791
Claims priority, application Fed. Rep. of Germany, Jan. 4, 1980, 3000140
Int. Cl.³ A01N *55/02;* C07F *7/18*
U.S. Cl. 424—184 9 Claims

1. An azolyl-silyl-glycol ether of the formula



I

where R^1, R^2 and R^3 denote C_{1-4}-alkyl or phenyl, R^4 denotes C_{1-4}-alkyl, halogen or phenyl, m denotes one of the integers 0, 1, 2 and 3, and X and Y denote CH or N or an organic agriculturally acceptable salt thereof.

7. A method for combatting fungi, which comprises applying to a host for fungi growth or the fungi growing thereon a fungicidally effective amount of an azolyl-silyl-glycol ether as claimed in claim 1, or an agriculturally acceptable salt thereof.

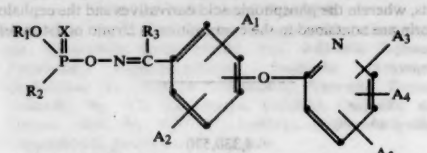
4,330,536

OXIME PHOSPHATES AND THEIR USE FOR COMBATING PESTS

Georg Pissiotas, Lörrach, Fed. Rep. of Germany, and Ernst Beriger, Allschwil, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Feb. 23, 1981, Ser. No. 237,238
Claims priority, application Switzerland, Mar. 7, 1980, 1820/80; Sep. 17, 1980, 6972/80; Jan. 15, 1981, 243/81
Int. Cl.³ A01N *57/00;* C07F *9/06*
U.S. Cl. 424—200 10 Claims

1. An oxime phosphate of the formula



wherein

R_1 is C_1–C_6-alkyl,

R_2 is C_1–C_7-alkoxy or C_1–C_6-alkylthio,

R_3 is hydrogen, C_1–C_6-alkyl or cyano,

A_1, A_2, A_3 and A_4 are each hydrogen or halogen,

A_5 is hydrogen, halogen, trifluoromethyl or C_1–C_6-alkyl, and

X is oxygen or sulfur.

9. A insecticidal composition which comprises an insecticidally effective amount of a compound according to claim 1 as active ingredient, and suitable carriers and/or other additives.

10. A method of combating insects on animals and plants, which method comprises applying thereto an insecticidally effective amount of a compound according to claim 1.

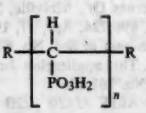
4,330,537

COMPOSITIONS FOR INHIBITING MOBILIZATION OF CALCIUM PHOSPHATE IN ANIMAL TISSUE

Marion D. Francis, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Continuation of Ser. No. 858,302, Dec. 7, 1977, Pat. No. 4,230,700, which is a continuation of Ser. No. 677,133, Apr. 15, 1976, abandoned, which is a continuation of Ser. No. 582,573, Jun. 2, 1975, abandoned, which is a continuation-in-part of Ser. No. 361,354, May 17, 1973, abandoned, which is a continuation-in-part of Ser. No. 260,939, Jun. 8, 1972, abandoned. This application Jun. 18, 1980, Ser. No. 160,520
The portion of the term of this patent subsequent to Oct. 28, 1997, has been disclaimed.
Int. Cl.³ A61K *31/66, 31/59*
U.S. Cl. 424—204 17 Claims

1. A pharmaceutical composition in dosage unit from comprising from about 5 mg. to 10 g. of a phosphonate selected from the group consisting of:



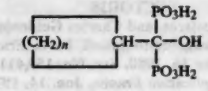
I.

wherein each R is hydrogen or CH_2OH and n is an integer of from 3 to 10;

II.

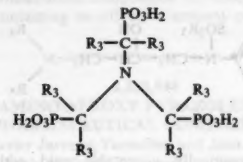
wherein R_1 is hydrogen, alkyl containing from 1 to about 20 carbon atoms, alkenyl containing from 2 to about 20 carbon atoms, phenylethenyl, benzyl, halogen, hydroxyl, amino, dimethylamino, diethylamino, —CH_2COOH, —$CH_2PO_3H_2$, $CH(PO_3H_2)(OH)$, or —$[CH_2C(PO_3H_2)_2]_n$—H wherein n is 1 to 15, R_2 is hydrogen, lower alkyl, amino, benzyl, halogen, hydroxyl, —CH_2COOH, —$CH_2PO_3H_2$, or —$CH_2CH_2PO_3H_2$;

III.



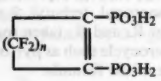
wherein n is an integer of from 3 to 9;

IV.



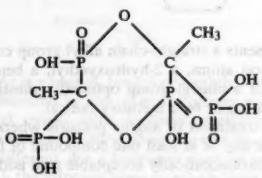
wherein each R_3 is hydrogen or lower alkyl;

V.

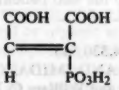


wherein n is an integer of from 2 to 4;

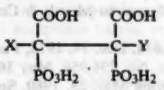
VI.



VII.

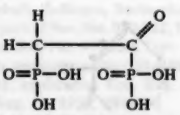


VIII.

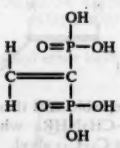


wherein X and Y are each hydrogen or hydroxy;

IX



X.



and the pharmaceutically acceptable salts thereof; and (2) a Vitamin D-active antirachitic compound or mixtures thereof having an activity of from about 100 I.U. to about 50,000 I.U.

4,330,538

USE OF ESTRADIOL VALERATE AS AN ANTI-DEPRESSANT

Turan M. Itil, Nyack, N.Y.; Gerhard Laudahn, and Werner M. Herrmann, both of Berlin, Fed. Rep. of Germany, assignors to Schering Aktiengesellschaft, Berlin and Bergkamen, Fed. Rep. of Germany

Filed Dec. 22, 1978, Ser. No. 972,626

Claims priority, application Fed. Rep. of Germany, Dec. 23, 1977, 2758549

Int. Cl.³ A01N *45/00*; A61K *31/56*

U.S. Cl. 424—238 **9 Claims**

1. A method of treating depression in a human suffering from depression which is not caused by an estrogen deficiency, comprising administering to the human an anti-depressantly effective amount of estradiol valerate.

4,330,539

NOVEL 17-AMINO-16-HYDROXY STEROIDS OF THE ANDROSTANE AND OESTRANE SERIES AND DERIVATIVES THEREOF

Thomas Sleigh, Wishaw; David S. Savage, Glasgow, both of Scotland, and Filippus J. Zeelen, Heesch, Netherlands, assignors to Akzo nv, Oss, Netherlands

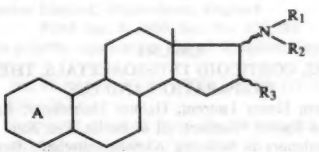
Filed Jan. 29, 1981, Ser. No. 230,042

Int. Cl.³ A61K *31/56*

U.S. Cl. 424—238 **9 Claims**

1. Steroids of the androstane and oestrane series selected from the group consisting of compounds having the formula I:

I



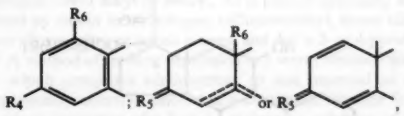
and pharmaceutically acceptable non-toxic acid additional salts thereof, wherein:

R_1=H or hydrocarbyl of one to six carbon atoms;

R_2=H or hydrocarbyl of one to six carbon atoms;

R_3=a free, esterified or etherified hydroxyl group;

ring A, inclusive of carbon atoms 6 and 9, has one of the following configurations:



in which

R_4=a free, esterified or etherified hydroxyl group;

R_5=O or H(R_7), wherein R_7 is a free, esterified or etherified hydroxyl group;

R_6=H or methyl and

the dotted lines represent an optional double bond in the 4,5-position when R_5 is O or H(R_7), or in the 5,6-position when R_5 is H(R_7), and the enatiomers and racemates of these steroids.

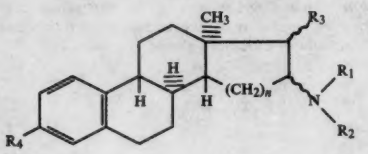
3. Pharmaceutical composition having anti-arrhythmic properties, comprising a pharmaceutically effective amount of one or more of the compounds of claim **1** or **2** in admixture with a usual pharmaceutical carrier.

4,330,540
ENT-16-AMINO-17-HYDROXY-OESTRA-1,3,5(10)-TRIENES AND DERIVATIVES THEREOF, AND PHARMACEUTICAL COMPOSITIONS

Filippus J. Zeelen, Heesch, Netherlands, assignor to Akzo N.V., Oss, Netherlands

Filed Jan. 29, 1981, Ser. No. 230,043
Int. Cl.³ A01N *45/00*; C07J *1/00*
U.S. Cl. 424—238 8 Claims

1. A compound selected from the group consisting of an ent-16-amino-17-hydroxy-oestra-1,3,5(10)-triene having the formula I:



I

and pharmaceutically acceptable non-toxic acid addition salts thereof, wherein:

n=1;

R_1=H or hydrocarbyl of 1 to 6 carbon atoms;

R_2=H or hydrocarbyl of 1 to 6 carbon atoms; or

R_1 and R_2 together is alkylene of 4 or 5 carbon atoms;

R_3=a free, esterified or etherified hydroxyl group; and

R_4=a free, esterified or etherified hydroxyl group.

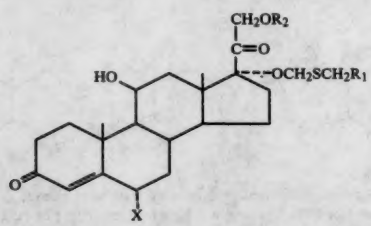
3. A compound according to claim 1, wherein the 16-amino group is in the α-position and the 17-oxy group is in the β-position.

4,330,541
NOVEL CORTICOID 17-THIOACETALS, THEIR PREPARATION AND USE

Klaus Annen; Henry Laurent; Helmut Hofmeister; Karl Petzoldt, and Rudolf Wiechert, all of Berlin, Fed. Rep. of Germany, assignors to Schering Aktiengesellschaft, Berlin and Bergkamen, Fed. Rep. of Germany

Filed Jan. 21, 1981, Ser. No. 226,985
Claims priority, application Fed. Rep. of Germany, Dec. 21, 1979, 2952003
Int. Cl.³ A61K *31/56*
U.S. Cl. 424—243 15 Claims

1. A corticoid 17-thioacetal of the formula



wherein

X is hydrogen,

R_1 is hydrogen or C_1–C_6 alkyl, and

R_2 is hydrogen or the acyl group of a C_{1-16}-hydrocarbon carboxylic acid.

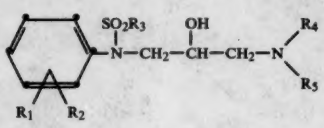
13. A method of treating inflammation in a host in need of such treatment comprising administering an antiinflammatorily effective amount of a compound of claim 1.

4,330,542
N(SULFONYL)ANILINES FOR TREATING ANGINA PECTORIS

Marcel Descamps, Rosieres, and Charles Goldenberg, Brussels, both of Belgium, assignors to Sanofi, Paris, France

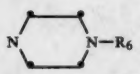
Filed May 16, 1980, Ser. No. 150,411
Claims priority, application France, Jun. 14, 1979, 79 15232
Int. Cl.³ A61K *31/535, 31/495*; C07D *295/08*
U.S. Cl. 424—248.5 22 Claims

1. Compounds of the formula:



I

and the pharmaceutically acceptable acid addition salts thereof, wherein R_1 and R_2, which are the same or different, represent an allyloxy, acetamide or carboxamide group or a hydrogen or chlorine atom, R_3 represents a methyl, phenyl, methylphenyl or methoxyphenyl group, R_4 represents a hydrogen atom and R_5 an isopropyl, terbutyl, 2-phenoxy-ethyl, 3-phenyl-propyl group, or R_4 and R_5 taken together form with the nitrogen atom a heterocycle such as pyrrole, morpholine or a substituted piperazine of the formula:



II

wherein R_6 represents a straight-chain alkyl group containing from 1 to 3 carbon atoms, a 2-hydroxyethyl, a benzyl or a 2-pyridyl group or a phenyl group optionally substituted by either a halogen atom or by a methoxy radical.

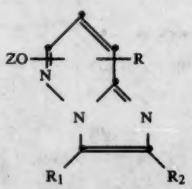
19. Method of treatment of angina pectoris whereby from 100 to 200 mg per day of at least one compound of formula I of claim 1 or a pharmaceutically acceptable acid addition salt thereof are administered to the said patient.

4,330,543
IMIDAZOAZINES AND IMIDAZODIAZINES

John J. Baldwin, Lansdale, and William C. Lumma, Jr., Pennsburg, both of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Division of Ser. No. 969,631, Dec. 14, 1978, Pat. No. 4,233,301, which is a division of Ser. No. 796,958, May 16, 1977, Pat. No. 4,166,851. This application Mar. 28, 1980, Ser. No. 135,022
Int. Cl.³ C07D *487/04*; A61K *31/535, 31/415*; C07D *413/14*
U.S. Cl. 424—248.56 7 Claims

1. A compound having the formula



and pharmaceutically acceptable salts thereof wherein

Z is—CH_2—$CHOR_3$—CH_2NHR_4 wherein R_3 is H or C_2–C_{12} acyl and R_4 is C_1–C_{12} alkyl,

R is H,—SCF_3,—CN, halogen, C_{1-6}alkyl, NH_2, C_1–C_6-haloalkyl, C_1–C_{12}acyl, phenyl —$COOR_5$ wherein R_5 is H C_1–C_6alkyl or

C_6–C_{12}carbocyclic aryl,

—$CONR_6R_7$ wherein R_6 and R_7 when separate, are H or C_1–C_6alkyl and when joined, are
—CH_2—$(CH_2)_3$—CH_2—, —CH_2—CH_2—O—CH_2—CH_2—,
—CH_2—CH_2—NH—CH_2—CH_2—, or
—CH_2—CH_2—$N(CH_3)$—CH_2—CH_2—,
C_1–C_6alkylthio, C_1–C_6alkylsulfinyl or C_1–C_6alkylsulfonyl, and
R_1 and R_2 when separate R and when joined are —$(CH_2)_n$—wherein n is 3, 4 or 5.

7. A pharmaceutical composition for effecting β-adrenergic blockade containing an effective amount of a compound of claim 1.

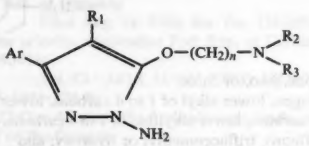
4,330,544

AMINO-ALKOXY PYRAZOLES AND PHARMACEUTICAL COMPOSITIONS

Francois-Xavier Jarreau, Versailles, and Jean J. Koenig, Vernou La Celle, both of France, assignors to Etablissements Nativelle S.A., Paris, France

Filed Apr. 1, 1981, Ser. No. 250,952
Claims priority, application France, Apr. 1, 1980, 80 07301
Int. Cl.³ A61K *31/535, 31/415;* **C07D** *413/12, 231/20*
U.S. Cl. 424—248.56 **8 Claims**

1. An aminoalkoxypyrazole of the general formula (I)



(I)

wherein Ar is a phenyl, benzyl or naphthyl group, or a phenyl group substituted by one or more halogen atoms, or by one or more alkyl, cyano, nitro, hydroxy or alkoxy groups; R_1 is a hydrogen atom or an alkyl group; R_2 and R_3, which may be the same or different, are a hydrogen atom or an alkyl group, or form, with the nitrogen atom to which they are attached, a 5- to 7-membered heterocyclic ring; n is an integer of from 1 to 4; as well as the mineral or organic acid salts thereof.

6. A medicinal composition for the treatment of cardiac disorders or depressive states comprising a therapeutically effective amount of an aminoalkoxypyrazole of claim 1, 2 or 3 or a pharmaceutically acceptable salt thereof along with a pharmaceutically acceptable carrier or diluent.

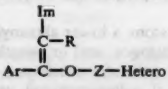
4,330,545

HETEROCYCLIC IMIDAZOLYL VINYL ETHERS AND USE OF SAME AS FUNGICIDES OR BACTERICIDES

Ludwig Zirngibl, Zofingen; Johanna Fischer, Reiden, and Kurt Thiele, Zofingen, all of Switzerland, assignors to Siegfried Aktiengesellschaft, Zofingen, Switzerland

Continuation-in-part of Ser. No. 970,312, Dec. 18, 1978, Pat. No. 4,210,656, and Ser. No. 970,330, Dec. 18, 1978, Pat. No. 4,210,657. This application May 19, 1980, Ser. No. 150,964
Claims priority, application Fed. Rep. of Germany, Feb. 21, 1977, 2757113; Sep. 11, 1978, 2839388
Int. Cl.³ A01N *43/50, 43/54, 43/56;* **C07D** *401/12, 403/12, 407/12, 409/12*
U.S. Cl. 424—263 **10 Claims**

1. An imidazolyl vinyl ether having the formula



or an acid addition salt thereof acceptable for bactericidal or fungicidal use, wherein

Ar is a radical selected from the group consisting of phenyl, naphthyl, 4-halo-phenyl and 2,4-dihalo-phenyl,
R is either hydrogen, methyl, ethyl, propyl or butyl,
Im signifies unsubstituted 1-H-imidazol-1-yl or substituted 1-H-imidazol-1-yl which has one to three substituents independently selected from the group consisting of halogeno, alkyl and alkoxy of one to four carbon atoms, and not more than one nitro group,
Z is C_1–C_{12} alkylene or C_1–C_{12} alkylene having its carbon chain on the Hetero-end terminated by and/or once or twice interrupted by a linkage selected from the group consisting of oxy, thio, sulfinyl or sulfonyl,
and Hetero is thienyl, pyridyl, furyl, pyrrolyl, imidazolyl, pyrazolyl, triazolyl, pyrimidinyl, pyridazinyl, benzothienyl, indolyl, benzofuryl, pyrazinyl, quinolyl or quinazolinyl, each of which is either unsubstituted or mono- or polysubstituted with substituents that are independently selected from the group consisting of halogeno, trifluoromethyl, alkyl, cycloalkyl, alkoxy and alkylthio of from one to six carbon atoms in the alkyl or cycloalkyl portion of each, phenyl, benzyl, cyano, nitro and amino.

7. A process for controlling fungi or bacteria which comprises applying to a substrate containing same an effective amount of a compound of claim 1.

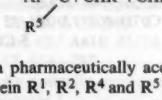
4,330,546

3-ARYL-3-ARYLOXYPROPYLAMINES

Robin G. Shepherd, Burnham, England, assignor to John Wyeth & Brother Limited, Maidenhead, England

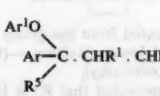
Filed Sep. 3, 1980, Ser. No. 183,786
Claims priority, application United Kingdom, Sep. 14, 1979, 7932046
Int. Cl.³ A61K *31/44;* **C07D** *213/63, 213/64*
U.S. Cl. 424—263 **6 Claims**

1. A compound selected from the group consisting of a 3-aryl-3-aryloxypropylamine of the formula



and a pharmaceutically acceptable acid addition salt thereof wherein R^1, R^2, R^4 and R^5 are hydrogen or lower alkyl, R^3 is hydrogen, lower alkyl or benzyl, Ar is phenyl optionally substituted by one or more halogen, trifluoromethyl, lower alkyl, lower alkoxy, nitro or amino groups, and Ar^1 is 2- or 4-pyridyl.

6. A method of treating depression in a warm blooded mammal which comprises administering to said mammal an antidepressantly effective amount of a compound selected from the group consisting of a 3-aryl-3-aryloxypropylamine of the formula



and a pharmaceutically acceptable acid addition salt thereof, wherein R^1, R^2, R^4 and R^5 are hydrogen or lower alkyl, R^3 is hydrogen, lower alkyl or benzyl, Ar is phenyl optionally substituted by one or more halogen, trifluoromethyl, lower alkyl, lower alkoxy, nitro or amino groups and Ar^1 is 2- or 4-pyridyl.

4,330,547

COMBATTING FUNGI WITH TRIAZOLYLPHENACYL PYRIDYL ETHER DERIVATIVES

Udo Kraatz, Leverkusen; Karl H. Büchel, Burscheid; Jörg Stetter, Wuppertal; Paul-Ernst Frohberger, Leverkusen, and Wilhelm Brandes, Leichlingen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

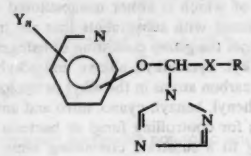
Filed Dec. 18, 1980, Ser. No. 217,948

Claims priority, application Fed. Rep. of Germany, Jan. 5, 1980, 3000244

Int. Cl.³ C07D *401/12;* A01N *43/40*

U.S. Cl. 424—263 10 Claims

1. A triazolyphenacyl pyridyl ether derivative of the formula



in which

R is phenyl, or phenyl substituted by one or more substituents selected independently from halogen, alkyl and alkoxy with in each case 1 to 4 carbon atoms, phenoxy, phenyl, halophenoxy and halophenyl,

X is —CO— or CH(OH)—,

Y each independently is halogen, alkyl or alkoxy with in each case 1 to 4 carbon atoms, or cyano, and

n is 0, 1, 2, 3 or 4,

or a physiologically acceptable addition product thereof with an acid or metal salt.

9. A method of combating fungi, characterized in that there is applied to the fungi, or to a habitat thereof, a fungicidally effective amount of a compound or addition product thereof according to claim 1.

4,330,548

MERCAPTOACYL DERIVATIVES OF KETO SUBSTITUTED PIPECOLIC ACID

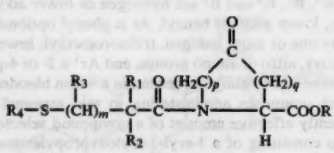
Miguel A. Ondetti, Princeton, N.J., assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.

Division of Ser. No. 112,004, Jan. 14, 1980, Pat. No. 4,296,113. This application Jun. 29, 1981, Ser. No. 278,522

Int. Cl.³ A61K *31/445, 31/44;* C07D *409/12, 211/32*

U.S. Cl. 424—263 5 Claims

1. A compound of the formula



or a physiologically acceptable salt thereof, wherein

R is hydrogen or lower alkyl;

R_1 and R_3 are independently selected from the group consisting of hydrogen, lower alkyl, lower alkylthio, $-(CH_2)_n-SH$, and halo substituted lower alkyl;

R_2 is hydrogen or lower alkyl provided that R_2 is lower alkyl only when R_1 is lower alkyl;

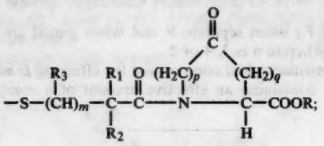
m is zero, one or two;

n is one, two, or three;

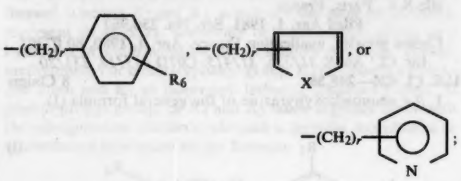
p and q are each one or two provided that the sum of p+q is three;

R_4 is hydrogen,

p-methoxybenzyl, trityl, or provided that neither R_1 nor R_3 is $-(CH_2)_n-SH$



R_5 is lower alkyl, chloro, bromo or fluoro substituted lower alkyl, $-(CH_2)_r$-cycloalkyl wherein the cycloalkyl group is a saturated ring of 3 to 7 carbons,



r is zero, one, two, or three;

R_6 is hydrogen, lower alkyl of 1 to 4 carbons, lower alkoxy of 1 to 4 carbons, lower alkylthio of 1 to 4 carbons, chloro, bromo, fluoro, trifluoromethyl or hydroxy; and

X is oxygen or sulfur.

4,330,549

COUMARINS CONNECTED VIA AN OXYALKYL GROUP WITH A PIPERIDINE RING HAVING ANTI-ALLERGIC ACTION

Walter-Gunar Friebe, Darmstadt; Werner Winter, Heppenheim; Max Thiel; Androniki Roesch, both of Mannheim, and Otto-Henning Wilhelms, Weinheim-Rittenweier, all of Fed. Rep. of Germany, assignors to Boehringer Mannheim GmbH, Mannheim, Fed. Rep. of Germany

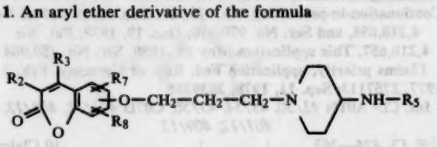
Filed Dec. 17, 1979, Ser. No. 104,205

Claims priority, application Fed. Rep. of Germany, Jan. 15, 1979, 2901336

Int. Cl.³ A61K *31/445;* C07D *311/06, 311/16*

U.S. Cl. 424—267 10 Claims

1. An aryl ether derivative of the formula



wherein

R_2 and R_3 each independently is a hydrogen atom or lower alkyl radical,

R_5 is a hydrogen atom; a lower alkanoyl radical optionally substituted by halogen, aryl or benzthiazole; a lower alkenoyl radical optionally substituted by aryl; an aroyl, furancarbonyl, thiophenecarbonyl or pyridinecarbonyl radical optionally substituted by halogen, hydroxyl, lower alkyl, lower alkoxy, lower alkoxycarbonyl, lower al-

kanoyloxy, carboxyl, nitro, amino, nitrile, trifluoromethyl, carbamoyl or benzyl; a C_{3-7}-cycloalkylcarboxylic acid radical, a benzenesulphonic acid radical; or a lower alkyl sulphonic acid radical,

R_7 is a hydrogen atom, a lower alkyl radical or a lower alkanoyl radical, and

R_8 is a hydrogen atom, a lower alkyl radical, a lower alkoxy radical or a hydroxyl group;

or a pharmacologically acceptable salt thereof.

8. An anti-allergic composition of matter comprising an anti-allergically effective amount of a compound or salt according to claim 1 in admixture with a diluent.

9. A method of combating an allergic response in a patient which comprises administering to the patient an anti-allergically effective amount of a compound or salt according to claim 1.

4,330,550
OXOIMIDAZOLINEALKANOIC ACIDS AND THEIR SALTS AND ESTERS, THEIR PREPARATION AND PHARMACEUTICAL COMPOSITIONS CONTAINING THEM

Hans-Heiner Lautenschläger, Cologne; Hans Betzing, Kerpen-Horrem, and Brigitte Stoll, Cologne, all of Fed. Rep. of Germany, assignors to A. Nattermann & Cie. GmbH, Cologne, Fed. Rep. of Germany

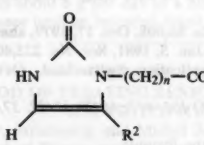
Filed Aug. 15, 1980, Ser. No. 178,450

Claims priority, application Fed. Rep. of Germany, Aug. 28, 1979, 2934746

Int. Cl.³ A61K *31/415;* **C07D** *233/30*

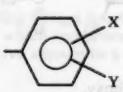
U.S. Cl. 424—273 R **24 Claims**

1. ω-(2-Oxo-4-imidazolin-1-yl)-alkanoic acids, salts and ester thereof of the formula



I

in which n denotes an integer from 1 to 8, R^1 denotes H, a non-toxic cation, or a straight-chain or branched saturated hydrocarbon group of 1 to 6 carbon atoms, and R^2 is selected from the group consisting of naphthyl, or an unsubstituted or substituted aromatic radical of formula



wherein the substituents X and Y, which may be the same or different, represent H, halogen or alkoxy.

4,330,551
THERAPEUTIC METHOD

Daniel W. Stout, North Palm Beach, and Paul R. McGinnes, Lake Park, both of Fla., assignors to Synergetics Co.

Filed Aug. 26, 1980, Ser. No. 181,464

Int. Cl.³ A61K *27/00, 31/14, 31/40, 31/44, 31/47, 31/415, 31/495*

U.S. Cl. 424—273 R **28 Claims**

1. A method of treating a patient afflicted with pain which comprises administering to the patient as the sole pain-relieving constituent a pain-relieving amount of an aqueous emulsion comprising a pharmacologically acceptable cationic surfactant, a pharmacologically acceptable non-ionic surfactant, and water; said emulsion containing at least about 5 weight percent of said cationic surfactant and at least about 5 weight percent of said non-ionic surfactant.

4,330,552
ANTIINFLAMMATORY 4,5-DIARYL-2-ARYLTHIOIMIDAZOLES

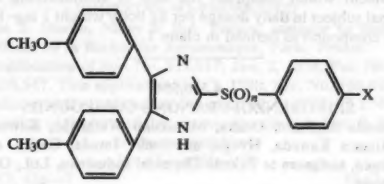
Saul C. Cherkofsky, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Nov. 6, 1980, Ser. No. 204,569

Int. Cl.³ A61K *31/415;* **C07D** *233/84*

U.S. Cl. 424—273 R **15 Claims**

1. A compound of the formula



where

X=F, Cl or OCH_3; and

n=0, 1 or 2.

11. A method of treating inflammation in a mammal which comprises administering to the mammal an effective antiinflammatory amount of a compound of claim 1.

4,330,553
7-OXO-PGI_2-DERIVATIVES AND PROCESS FOR THE PREPARATION THEREOF AND PHARMACEUTICAL COMPOSITIONS CONTAINING SAME

Vilmos Simonidesz; Ágnes Papp née Behr; Gábor Kovács; József Ivanics; Julia Dér née Földváry; István Stadler, and István Pallagi, all of Budapest, Hungary, assignors to Chinoin Gyógyszer és Vegyészeti Termékek Gyára R.T., Budapest, Hungary

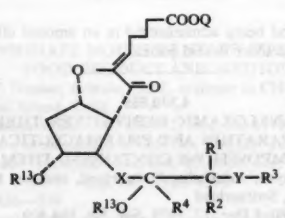
Filed Nov. 10, 1980, Ser. No. 205,292

Claims priority, application Hungary, Nov. 12, 1979, CI-1978; Nov. 12, 1979, CI-1988

Int. Cl.³ A61K *31/34;* **C07D** *307/935;* **A61K** *31/557*

U.S. Cl. 424—285 **29 Claims**

1. An optically active or racemic 7-oxo-PGI_2 compound of the formula I



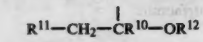
(I)

wherein

Q is hydrogen, a pharmacologically acceptable cation or lower alkyl

X is cis- or trans—CH=CH— or C≡C or —CH_2—CH_2—

R^{13} is hydrogen or C_{1-4} alkanoyl or a blocking group of the formula $R^7R^8R^9Si$ or



wherein R^7, R^8, R^9 are the same or different and are straight or branched chain, C_{1-4} alkyl groups, R^{10} and R^{11} represent the same or different groups selected from hydrogen and methyl and R^{12} stands for methyl or ethyl, or is a tetrahydropyran-2-yl group,

R^4 is hydrogen or lower alkyl in α- or β-position,

R^1 and R^2 stand for hydrogen or lower alkyl,

Y is methylene, oxygen or —NH—, and

R^3 is lower alkyl or phenyl which can be monosubstituted phenyl.

27. An anti-aggregation- or thrombus-dissolving-method of treatment which comprises the step of administering to an animal subject in daily dosage per kg body weight 1 mg–10 mg of a compound as defined in claim 1.

4,330,554
SPIROBENZOFURANONE COMPOUNDS

Hirosada Sugihara, Osaka; Masazumi Watanabe, Kawanishi; Mitsuru Kawada, Hyogo, and Isuke Imada, Osaka, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

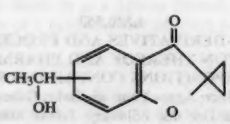
Continuation-in-part of Ser. No. 115,548, Jan. 25, 1980, Pat. No. 4,284,644, which is a continuation-in-part of Ser. No. 968,520, Dec. 11, 1978, abandoned. This application Apr. 17, 1981, Ser. No. 257,317

Claims priority, application Greece, Apr. 23, 1980, 61757; Japan, Mar. 30, 1981, 56/48285

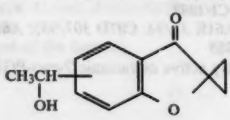
Int. Cl.³ C07D *307/94;* A61K *31/34*

U.S. Cl. 424—285 **7 Claims**

1. A compound of the formula:



5. A method of managing peptic ulcer in a patient which comprises administering to said patient a compound of the formula:



said compound being administered in an amount effective to manage peptic ulcer in said patient.

4,330,555
INDANYLOXAMIC DERIVATIVES, THEIR PREPARATION AND PHARMACEUTICAL COMPOSITIONS CONTAINING THEM

Trevor G. Payne, Arlesheim, Switzerland, assignor to Sandoz Ltd., Basel, Switzerland

Filed Dec. 17, 1979, Ser. No. 104,409

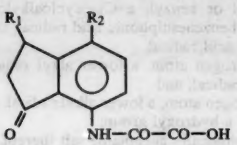
Claims priority, application Switzerland, Dec. 22, 1978, 13115/78

The portion of the term of this patent subsequent to Apr. 10, 1996, has been disclaimed.

Int. Cl.³ A61K *31/195, 31/215;* C07C *101/447*

U.S. Cl. 424—309 **9 Claims**

1. A compound of formula (I)



wherein

R_1 is hydrogen or alkyl (C_{1-10}), and

R_2 is alkyl (C_{1-10}),

or a pharmaceutically acceptable salt thereof, or a physiologically acceptable and hydrolysable ester thereof selected from the group consisting of the alkyl esters wherein alkyl has 1 to 4 carbon atoms, phenyl esters and phenyl esters monosubstituted by chlorine, bromine, alkyl having 1 to 4 carbon atoms or alkoxy having 1 to 4 carbon atoms.

8. A pharmaceutical composition for use in treating or effecting prophylaxis of allergic conditions comprising an effective amount of a compound of claim 1 or a physiologically acceptable and hydrolysable ester thereof, in association with a pharmaceutical diluent or carrier.

9. A method of treating or effecting prophylaxis of allergic conditions in animals which comprises administering a compound of claim 1 to an animal in need of such treatment.

4,330,556
MICROBICIDAL N-1'-HYDROCARBYLOXYCARBONYLETHYL)-N-ALKOXYACETYLANILINES

Adolf Hübele, Magden, Switzerland; Wolfgang Eckhardt, Lörrach, Fed. Rep. of Germany, and Walter Kunz, Oberwil, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

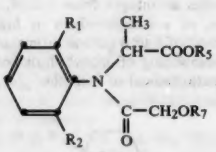
Continuation of Ser. No. 86,008, Oct. 17, 1979, abandoned. This application Jan. 5, 1981, Ser. No. 222,406

Claims priority, application Switzerland, Oct. 27, 1978, 11119/78

Int. Cl.³ C07C *101/447;* A01N *37/22, 37/24*

U.S. Cl. 424—309 **6 Claims**

1. A compound of the formula



wherein

R_1 is methyl or methoxy,

R_2 is methyl or chlorine,

R_5 is C_3 or C_4 alkyl, C_3 alkenyl or C_3 alkynyl, and

R_7 is C_1–C_3 alkyl.

5. A method for combatting phytopathogenic fungi which comprises applying thereto a fungicidally effective amount of a compound according to claim 1.

4,330,557
ACYL-CARNITINE AND USE THEREOF IN PARENTERAL ADMINISTRATION OF TRIGLYCERIDES

Claudio Cavazza, 35, Via Marocco, 00144 Rome, Italy

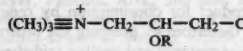
Continuation-in-part of Ser. No. 41,147, May 21, 1979, abandoned. This application Mar. 17, 1980, Ser. No. 130,801

Int. Cl.³ A61K *31/205*

U.S. Cl. 424—316 **14 Claims**

1. In the method of increasing in a human the level of fatty acids selected from the group consisting of oleic acid, linoleic acid, palmitic acid, stearic acid and linolenic acid by parenteral

intravenous administration of one or more triglycerides of said fatty acid to a human, the improvement which comprises sumultaneously administering a quantity of an acyl-carnitine sufficient to enhance the oxidation of said fatty acids in the body of said human, said acyl-carnitine having the general formula



wherein R represents acetyl, propionyl, butyryl, hydroxy butyryl, hexanoyl, octanoyl, decanoyl, palmitoyl, stearoyl, acetoacetyl, succinyl, isovaleryl and crotonyl.

4,330,558

PHARMACEUTICAL COMPOSITION AND METHOD FOR TREATING PERIPHERAL ORTHOSTATIC HYPOTENSION

Tomokazu Suzuki, No. 9-30-307, Okamoto 4-chome, Higashinada-ku, Kobe-shi, Hyogo-ken; Akira Hayashi, No. 290-1-210, Yamadaue, Suita-shi, Osaka-fu, and Yuichi Yamamura, No. 1-9-22, Nigawatakadai, Takarazuka-shi, Hyogo-ken, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka; Tomokazu Suzuki, Kobe; Akira Hayashi, Suita and Yuichi Yamamura, Takarazuka, all of, Japan

Filed Jul. 30, 1980, Ser. No. 173,620

Claims priority, application Japan, Jan. 23, 1980, 55-7234

Int. Cl.[3] A61K *31/195*

U.S. Cl. 424—319 **3 Claims**

1. A method for treating peripheral orthostatic hypotension which comprises orally or parenterally administering DL- or L-threo-3,4-dihydroxyphenylserine or a pharmaceutically acceptable acid addition salt thereof in an amount of from about 0.1 g to about 6 g per day to a human patient suffering from the disease until an intended result is obtained.

4,330,559

METHOD OF TREATING BENIGN PROSTATIC HYPERTROPHY

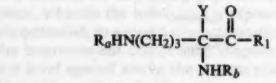
Philippe Bey, Strasbourg, and Michel Jung, Illkirch Groffenstaden, both of France, assignors to Merrell-Toraude et Cie, Strasbourg, France

Continuation-in-part of Ser. No. 28,739, Apr. 10, 1979, abandoned, which is a continuation-in-part of Ser. No. 814,765, Jul. 11, 1977, abandoned. This application Feb. 3, 1981, Ser. No. 231,072

Int. Cl.[3] A61K *31/195, 31/16, 31/22, 31/165*

U.S. Cl. 424—319 **8 Claims**

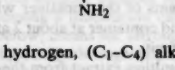
1. A method of treating benign prostatic hypertrophy in a patient in need thereof which comprises the administration to said patient of an effective amount of a compound of the formula



wherein:

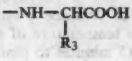
Y is FCH_2—, F_2CH—, or F_3C—;

R_a and R_b are, independently, hydrogen, $(C_1$–$C_4)$alkylcarbonyl, or the group



wherein R_2 is hydrogen, $(C_1$–$C_4)$ alkyl, benzyl, or p-hydroxybenzyl;

R_1 is hydroxy, $(C_1$–$C_8)$alkoxy, the group —NR_4R_5, wherein R_4 and R_5 are, independently, hydrogen, or, $(C_1$–$C_4)$alkyl, or the group



wherein R_3 is hydrogen, $(C_1$–$C_4)$ alkyl, benzyl, or p-hydroxybenzyl;

or the pharmaceutically acceptable salts or individual optical isomers thereof.

4,330,560

PROCESS FOR PRODUCING FOOD PROTEINS OF FUNGAL ORIGIN OR FROM MULTICELLULAR ORGANISMS FEMENTATION APPARATUS AND PROTEINS SO-PRODUCED

Thadee J. Staron, Noisy le Roi, France, assignor to Institut National de la Recherche Agronomique, Paris, France

Continuation of Ser. No. 912,017, Jun. 2, 1978, Pat. No. 4,238,567. This application Jul. 7, 1980, Ser. No. 166,410

Claims priority, application France, Jun. 7, 1977, 77 17449

The portion of the term of this patent subsequent to Dec. 9, 1997, has been disclaimed.

Int. Cl.[3] A23L *1/00*

U.S. Cl. 426—7 **10 Claims**

1. Process for producing food proteins, comprising the steps of: cultivating the fungus *Trichoderma Album* (I-032) in a nutrient media at a temperature below 28° C., the pH of said media being kept at a value between about 3.7 and 4.8; the nitrogen content (atomic N) of said media being adjusted to a value of about 4 to 5%, with respect to the dry material; the dissolved oxygen content being from about 6 to 10 mg/l; said cultivation being carried out with stirring which does not cause lysis of the fungus; and under conditions such that foaming is avoided.

4,330,561

COLORED GELATIN COVERING

Kaoru Nemoto; Toshichika Ogasawara, and Sadao Bessho, all of Tokyo, Japan, assignors to Chugai Seiyaku Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 13, 1980, Ser. No. 130,183

Claims priority, application Japan, Mar. 23, 1979, 54/33386

Int. Cl.[3] A23L *1/04*

U.S. Cl. 426—140 **1 Claim**

1. A gelatin covering consisting generally of gelatin and a sufficient amount of caramel to provide a desired degree of coloring, said caramel being substantially free from substances with a molecular weight up to about 10,000, whereby said caramel does not cause the water solubility of the covering to be substantially lowered with the passage of time.

4,330,562

INTERMEDIATE MOISTURE STABILIZED CHUNKY FOOD PRODUCT AND METHOD

Abdalla E. Nassar, Artesia, Calif., assignor to CHB Foods, Inc., Terminal Island, Calif.

Continuation of Ser. No. 108,573, Dec. 31, 1979, abandoned, which is a continuation of Ser. No. 919,123, Jun. 26, 1978, abandoned. This application Oct. 15, 1980, Ser. No. 197,069

Int. Cl.[3] A23K *1/10*

U.S. Cl. 426—310 **17 Claims**

1. A method for preparing a microbiologically shelf stable extruded proteinaceous food product having a protein content of between 15 and 35% by weight, a moisture content of between about 25 and 35% by weight, a fat content of from 3 to 10%, from about 20 to 40% by weight of carbohydrates, and at least about 0.1% of an antimycotic agent in an amount sufficient to inhibit the growth of yeast or mold, from 5 to 15% by

weight of polyhydroxy alcohol and a water activity (A_w) of between about 0.75 and 0.85 which consists of the steps of:

(a) blending and heating a mixture of water, meats, fat, salt, antimycotic agent and a polyhydroxy alcohol in an amount sufficient to produce a microbiologically shelf stable product at a temperature of at least 185° F. for a period of at least 15 minutes to pasteurize the admixture and form a homogeneous, pumpable, pasteurized slurry;

(b) cooling the slurry to essentially ambient room temperature;

(c) adding the cooled pasteurized slurry to a dry, non-pasteurized admixture of toasted particulate proteinaceous vegetable material and toasted cereal grain material components, having a maximum moisture content of 10–12% and minimal bacterial contamination said mixture containing up to 40% by weight carbohydrate, which carbohydrate consists in part of sugar, and mixing the admixture to produce a homogeneous blend containing between about 25 and 35% by weight moisture at a temperature below about 100° F.;

(d) extruding the blended product at ambient temperatures and pressures without applying heat thereto, through a die of predetermined dimensions whereby a continuous, essentially non-expanded stream of said product is formed and comminuting the extruded stream of blended product into chunks of pre-determined size and essentially normal bulk density;

(e) coating the chunks of extruded product with a coating consisting essentially of an aqueous solution of vegetable gum and at least about 0.2% of an antimycotic agent in an amount sufficient to inhibit surface growth of molds or yeasts; and

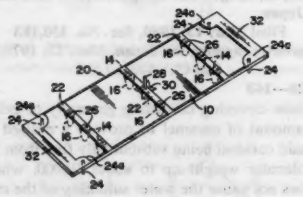
(f) passing the coated chunks through a drying zone to dry the applied coating to a shiny, non-tacky finish.

4,330,563

PROCESS FOR MAKING AN EDIBLE FROZEN FOOD PRODUCT

Edwin B. Settle, Jr., 2864 Whitney Rd., Clearwater, Fla. 33520

Filed May 5, 1980, Ser. No. 146,792
Int. Cl.³ A23G *9/04*
U.S. Cl. 426—389 **2 Claims**



1. A process for making an edible frozen food product, comprising the steps of providing a die having at least one cavity formed therein,

shaping said cavity so that it has a generally hyperbolic configuration when viewed in vertical cross section,

lining said cavity with a blank of flexible sheet material of generally square configuration so that the respective corners of said sheet material protrude upwardly of the plane of said die, in substantially equidistantly spaced, circumferentially disposed, relation to one another,

charging an edible, liquid-state, freezable substance into said cavity and filling said cavity to its rim,

placing a slotted carrier strip member having a length greater than the diameter of said cavity in overlying and substantially bisecting relation to the upwardly opening end of said filled cavity,

inserting a handle member through said slot formed in said carrier strip member so that the inserted portion of said handle member is embedded within said edible product and aligning said handle member so that it is disposed in substantially upstanding relation to said die,

freezing said freezable product so that the embedded portion of said handle member is rigidly maintained therein, removing said carrier strip member, removing said frozen product from said cavity by lifting said handle member, and

exposing said product for consumption by removing said sheet material therefrom by grasping the protruding corners of said sheet material and peeling said sheet material from said product.

4,330,564

FRYER OIL TREATMENT COMPOSITION AND METHOD

Bernard Friedman, 2914 Fairview St., Allentown, Pa. 18104

Filed Aug. 23, 1979, Ser. No. 69,238
Int. Cl.³ A23D *5/02*
U.S. Cl. 426—417 **13 Claims**

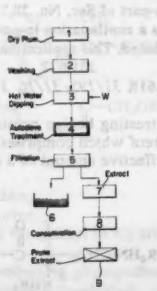
1. A process for treating used fryer cooking oil comprising the steps of mixing said used cooking oil at a temperature of from about 300° to about 400° F. with a composition comprised of porous carrier, water and food compatible acid; and filtering the residue of said composition from said oil; wherein said sorbent and water are present in said composition in amounts sufficient to disperse the composition throughout the hot oil without substantial spattering of the oil upon said mixing, and wherein said porous carrier, water and food compatible acid are present in said composition in amounts to improve the cooking properties of the treated used cooking oil by increasing the useful cooking lifetime of the used oil and by minimizing oily residue on food products cooked with the treated used cooking oil.

4,330,565

PROCESS FOR PRODUCING FRUIT EXTRACTS

Akiko Hamada, Tokyo, Japan, assignor to Japan (Impex) Limited, Tokyo, Japan

Filed May 24, 1978, Ser. No. 909,175
Claims priority, application Japan, Sep. 28, 1977, 52/115628
Int. Cl.³ A23L *2/02, 2/04*
U.S. Cl. 426—431 **8 Claims**



1. In a process for producing fruit extracts by heating fruit as raw material for extraction, followed by concentrating the resulting extract, the improvement which comprises:

adding water to fruit as the raw material;

introducing the resulting mixture into a closed air tight container;

heating the contents of the container while simultaneously pressurizing said container at about 2 atm. for a given time to extract the fruit;

separating the resulting extract from the resulting fruit residue; and

concentrating the thus separated extract to obtain a fruit extract.

4,330,566

POURABLE, CRUNCHY BATTER FOR FOOD PRODUCTS

Richard Meyer, Phoenix, Ariz., and Sam H. Lee, San Jose, Calif., assignors to Amour-Dial, Inc., Phoenix, Ariz.

Continuation-in-part of Ser. No. 52,529, Jun. 27, 1979, abandoned. This application Dec. 8, 1980, Ser. No. 214,077

Int. Cl.³ A23D 5/00

U.S. Cl. 426—606 7 Claims

1. A shelf stable edible food coating composition comprising a fluid shortening containing from about 10 to 35% by weight of a solid triglyceride largely in the beta crystal form, a food grade binder to enhance the ability of the coating composition to adhere to a food item, and a breading material having a U.S. Standard sieve size of about 3–12, said binder and breading material being substantially distributed throughout said coating compositions.

4,330,567

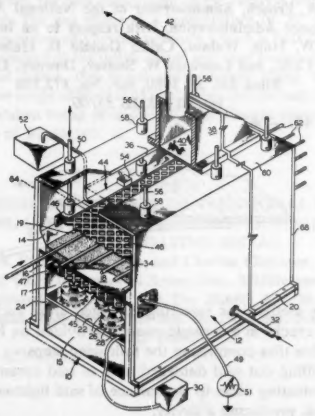
METHOD AND APPARATUS FOR ELECTROSTATIC COATING WITH CONTROLLED PARTICLE CLOUD

Donald J. Gillette, Guilford, Conn., assignor to Electrostatic Equipment Corp., New Haven, Conn.

Continuation-in-part of Ser. No. 114,656, Jan. 23, 1980, Pat. No. 4,297,386. This application Dec. 23, 1980, Ser. No. 218,521

Int. Cl.³ B05C 3/172, 19/02; B05D 1/22

U.S. Cl. 427—32 39 Claims



1. In a method for depositing a particulate material upon a workpiece, wherein the workpiece is exposed, at an effectively opposite potential, to a cloud of electrostatically charged particles, the improvement comprising: disposing a cloud control grid at a level spaced above the porous plate, and impressing upon the grid a voltage having either a negative or a positive value, with respect to ground, of 1 to 20 kilovolts, whereby the spatial characteristics of the cloud of charged particles can be affected so as to control the nature of the deposit produced upon the workpiece; and passing the workpiece through said cloud at a level below and out of contact with said grid.

24. Electrostatic fluidized bed coating apparatus comprising, in combination: a housing having a generally planar substantially horizontal porous support member mounted therein to define within said housing a fluidization chamber thereabove and a plenum therebelow; means for introducing gas into said plenum for passage upwardly through said support member to effect fluidization of particulate coating material supplied to said chamber; means for ionizing gas passing from said plenum into said fluidization chamber, to effect electrostatic charging of such particulate material; an electrically conductive control grid mounted within and substantially across said plenum effectively interposed between said support member and said ionizing means, said grid being adapted for control of its electrical potential and for substantially unimpeded passage therethrough of the ionized gas; and an electrically conductive cloud control grid disposed within and substantially across said chamber above said support member, said cloud control grid being adapted for control of its electrical potential, and said housing being adapted for the passage of a workpiece therethrough for exposure between said support member and said cloud control grid, whereby the cooperative effects of fluidization and electrostatic charging may produce a cloud of electrostatically charged particulate material above said support member, and whereby said grids may be used to affect the deposition of powder upon a workpiece exposed to such cloud.

4,330,568

METHOD OF BONDING AT LEAST TWO TYPES OF CERAMIC MATERIALS TO EACH OTHER

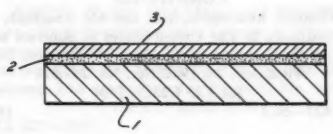
Valter Boehm, Cesky Tesin; Veslav Marosczyk; Antonin Cieslar, both of Trinec; Miloslav Bartuska, Prague; Karel Rybak, Prague; Karel Zverina, Prague, and Eduard Zelezny, Prague, all of Czechoslovakia, assignors to Vysoka skola chemicko-technologicka, Prague, Czechoslovakia

Continuation-in-part of Ser. No. 906,204, May 15, 1978, abandoned. This application Jan. 21, 1980, Ser. No. 113,592

Claims priority, application Czechoslovakia, May 13, 1977, 3157-77

Int. Cl.³ B05D 1/10, 3/02

U.S. Cl. 427—34 3 Claims



1. In a method of bonding at least two types of ceramic materials to each other in order to enhance both abrasion and corrosion resistances of fireproof plates for valve closures of foundry ladles, the improvement wherein a first refractory material made of fireclay, having a lower initial deformation temperature, is heated to a first temperature which is less than the melting temperature of the first material and which is in the range of from 800°–1400° C., and a second refractory material made of alumina, having a higher initial deformation temperature than that of the first material, is heated to a second temperature of from 2100°–6000° C., following which the second material is applied by throwing it at high speed in particulate form onto the preheated surface of said first material after preheating at least the surface of the particles of the second material to said second temperature, the first material, before having been brought into contact with the second material, being heated and superficially melted to a depth of from one to two millimeters, and the heating of the second material, before it is applied to the first material, bringing at least the surfaces of the particles of the second material into a condition such that there is produced a physico-chemical action producing a diffused interlayer between the first material and the second material deposited thereon.

4,330,569

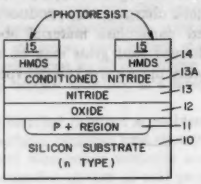
METHOD FOR CONDITIONING NITRIDE SURFACE

Michael R. Gulett, Oceanside, Calif.; Murray L. Trudel, Centerville, and John K. Stewart, Jr., West Carrollton, both of Ohio, assignors to NCR Corporation, Dayton, Ohio

Continuation of Ser. No. 42,476, May 25, 1979, abandoned, which is a continuation of Ser. No. 886,851, Mar. 15, 1978, abandoned, which is a continuation of Ser. No. 784,881, Apr. 5, 1977, abandoned. This application Oct. 10, 1980, Ser. No. 195,806

Int. Cl.³ B05D *3/06*

U.S. Cl. 427—38 3 Claims



1. A method for treating the surface of a silicon nitride layer formed on a semiconductor wafer to enhance the adhesion of photoresist to the surface during etching in buffered hydrofluoric acid, comprising in sequence of steps of:

exposing the surface of the silicon nitride layer to an ionized oxygen plasma for at least about 10 minutes; and

applying to the nitride surface a liquid solution of hexalkyldisilazane wherein the alkyl group is selected from methyl, ethyl and propyl.

4,330,570

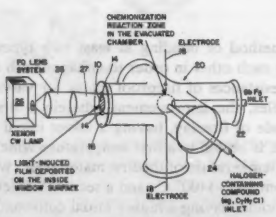
SELECTIVE PHOTOINDUCED CONDENSATION TECHNIQUE FOR PRODUCING SEMICONDUCTING COMPOUNDS

John F. Giuliani, Kensington, Md., and Abe Auerbach, Albany, N.Y., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 24, 1981, Ser. No. 257,028

Int. Cl.³ C23C *13/04*

U.S. Cl. 427—54.1 16 Claims



1. A method of producing luminescent and semiconductive materials comprising:

mixing reactive gases of antimony pentafluoride $(SbF_5)_n$ and a halogen containing compound in an evacuated chamber;

providing a substrate having a surface in contact with the reactive gases; and

passing ultraviolet light onto the substrate surface at its gas interface;

whereby a film having luminescent and semiconductive characteristics is deposited on the substrate surface by photoinduced condensation from chemionization of the gases.

4,330,571

METHOD OF APPLYING CORROSION PREVENTIVE COATING TO METALLIC CABLE

Philip H. Stovall, and Robert C. Webber, both of Marietta, Ga., assignors to Lockheed Corporation, Burbank, Calif.

Continuation of Ser. No. 973,097, Dec. 26, 1978, abandoned. This application Jul. 17, 1980, Ser. No. 169,885

Int. Cl.³ B05D *1/18, 3/02, 3/12, 5/12*

U.S. Cl. 427—120 4 Claims

1. The method of applying a corrosion preventive coating to a metallic cable length comprising the steps of:

(a) immersing the cable in a solvent-dispersed corrosion preventive compound solution consisting of a nonvolatile hydrocarbon material dispersed in at least one petroleum solvent from the group of naphtha, mineral spirits and Stoddards Solvent to constitute a homogeneous fluid formation that is free from grit, abrasives, chlorides and other impurities, the solvent quantity being such to produce a solution viscosity of from approximately 200 to approximately 250 centistokes at the temperature and time of such cable immersion;

(b) withdrawing the cable from the solution followed thereafter by the wiping of the cable with a solution adsorbent material that is at least wetted by said solution;

(c) and, drying said cable applied coating by evaporation of solution solvents.

4,330,572

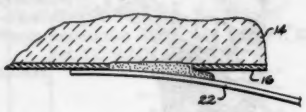
METHOD FOR REPAIR OF THIN GLASS COATINGS

Robert A. Frosch, Administrator of the National Aeronautics and Space Administration, with respect to an invention of; Jack W. Holt, Walnut, Calif.; Donald D. Helman, Buena Park, Calif., and Laurence W. Smiser, Downey, Calif.

Filed Jul. 25, 1980, Ser. No. 172,100

Int. Cl.³ B32B *35/00*

U.S. Cl. 427—140 3 Claims



1. The method for repairing damaged areas such as punctures or cracks in a ceramic coating provided on lightweight fused silica tiles comprising the following steps:

(a) drilling out said damaged area in said ceramic coating terminating close to the surface of said lightweight fused silica, producing a cavity;

(b) cleaning all loose particles from said drilled out cavity;

(c) filling said drilled out cavity flush with the upper surface of said coating with a filler material prepared by:

(i) mixing chopped silica fibers with a binder into a slurry, centrifuging, drying and sintering;

(ii) said sintered filler material then being pulverized and screened through −325 mesh;

(d) packing said filler material into said cavity;

(e) applying a coating over said filled cavity, said coating consisting essentially of:

97 percent borosilicate glass frit

B_2O_3-325 Mesh;

2.66 percent Boron silicide SiB_4; and

0.28 percent Potassium silicofluoride (K_2SiF_6);

(f) applying heat to said repaired area for curing said coating and filler material;

said heat being sufficient to cause said Boron silicide to oxidize in a fluid state which consumes enough of said frit to form an impervious, highly refractory layer.

4,330,573

METHOD OF PRODUCING A COMPOSITE MATERIAL

Leonid A. Kostandov, Vorobievskoe shosse, 6, kv. 4; Nikolai S. Enikolopov, Kutuzovsky prospekt, 26, kv. 245; Fridrikh S. Dyachkovsky, Vorobievskoe shosse, 2-b, kv. 9; Ljudmila A. Novokshonova, ulitsa 26 Bakinskikh komissarov, 7, korpus 4, kv. 38; Jury A. Gavrilov, Chistoprudny bulvar, 14, kv. 57, all of Moscow; Olga I. Kudinova, poselok Kratovo, ulitsa Malakhovskaya, 15, Moskovskaya oblast; Tatyana A. Maklakova, Leningradskoe shosse, 8/2, kv. 200, Moscow; Leonid A. Akopian, Mytischi, ulitsa Tereshkovoi, 11, kv. 21, Moskovskaya oblast; Otar P. Mchedlov-Petrosian, ulitsa Vorobieva, 14, kv. 5, Kharkov; Mikhail I. Boiko, ulitsa Arkhangelskaya, 12, kv. 54, Kharkov; Alexandr A. Staroselsky, ulitsa Stadionnaya, 21, kv. 76, Kharkov, and Vladimir P. Tkachenko, ulitsa akademika Makarova, 13, kv. 24, Moscow, all of U.S.S.R.

Division of Ser. No. 943,188, Sep. 18, 1978, Pat. No. 4,234,659. This application Nov. 17, 1980, Ser. No. 207,618

Int. Cl.³ B05D *7/24*

U.S. Cl. 427—213 5 Claims

1. A method of producing a composite material, comprising precipitating a complex organometallic catalyst from the gas phase in the pores of a solid porous carrier and polymerizing olefins from the gas phase on said catalyst precipitated in the pores of the solid porous carrier at a temperature of 50° to 165° C. and a pressure of 1 to 60 atm, said complex organometallic catalyst consisting of a first component being a compound of a transition metal and of a second component being an organic compound of a metal selected from the second or third group of the Periodic Table, said precipitation being effected in two steps, the first component of the catalyst being precipitated first, and the second component of the catalyst being precipitated second, the first component of the catalyst being precipitated from the gas phase at a temperature of 20° to 300° C. under conditions of varying pressure which is first raised by at least 30 percent of the initial value, and then lowered to at least the initial value, the initial gas pressure being maintained within the range of from 0.05 to 1.2 atm, the second component of the catalyst being precipitated from the gas phase at a temperature of 50° to 165° C.

4,330,574

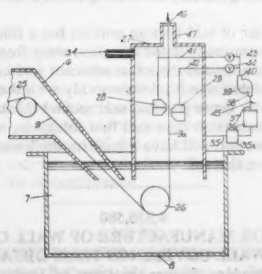
FINISHING METHOD FOR CONVENTIONAL HOT DIP COATING OF A FERROUS BASE METAL STRIP WITH A MOLTEN COATING METAL

Marvin B. Pierson, Franklin, and Charles Flinchum, Hamilton, both of Ohio, assignors to Armco Inc., Middletown, Ohio

Continuation-in-part of Ser. No. 30,660, Apr. 16, 1979, abandoned. This application Sep. 29, 1980, Ser. No. 191,857

Int. Cl.³ B05D *3/02*

U.S. Cl. 427—319 15 Claims



1. A finishing process for conventional continuous hot-dip, two-side coating of a ferrous base metal strip with a molten coating metal of the type wherein said ferrous base metal strip is caused to enter a bath of said molten coating metal contained in a coating pot, said ferrous base metal strip having been treated to bring it to a coating temperature sufficiently high to prevent casting of said coating metal thereon and low enough to prevent excess coating metal-base metal alloying and to render the surfaces of said strip clean and free of oxide as it passes through said molten coating metal bath, said finishing process comprising the steps of providing an enclosure in sealed relationship with said bath for said two-side coated ferrous base metal strip as it exits said bath and an exit in said enclosure for said coated strip, maintaining a non-oxidizing atmosphere within said enclosure, locating a jet finishing nozzle to either side of said coated strip within said enclosure, jet finishing said coated strip with a non-oxidizing gas and maintaining said jet finishing gas and said atmosphere within said enclosure at an oxygen level of less than about 1000 ppm, whereby to render said two-side coated strip uniform in appearance and coating thickness.

4,330,575

COATING MATERIAL

William B. Litchfield, Toton; John T. Gent, South Normanton, and James A. S. Graham, Borrowash, all of England, assignors to Rolls-Royce Limited, London, England

Filed Jan. 26, 1981, Ser. No. 228,198

Claims priority, application United Kingdom, Mar. 22, 1980, 8009750

Int. Cl.³ B05D *1/08*

U.S. Cl. 427—376.3 12 Claims

1. A powder suitable for flame spraying comprising a composition of an admixture of particles in which 20 to 40% by volume of the particles are an alloy selected from the group consisting of a nickel base alloy containing aluminium and chromium and a cobalt base alloy containing aluminium and chromium, and the balance of the particles are of a glass composition, each of said glass particles being hollow and coated with an alloy selected from the group consisting of a nickel base alloy containing chromium and aluminium and a cobalt base alloy containing chromium and aluminium.

4,330,576

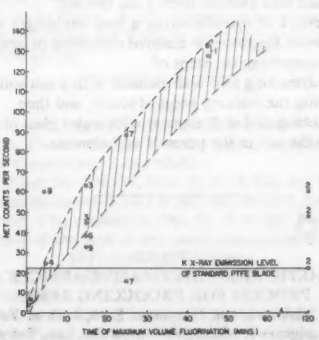
RAZOR BLADE COATING AND METHOD

Charles G. Dodd, Stratford, Conn., assignor to Warner-Lambert Company, Morris Plains, N.J.

Continuation-in-part of Ser. No. 770,977, Feb. 22, 1977, abandoned. This application Jul. 19, 1978, Ser. No. 925,917

Int. Cl.³ B05D *5/08*

U.S. Cl. 427—255.1 14 Claims



1. A method for coating a razor blade edge with a fluorinated polymer, comprising the steps of:

applying a substantially uniform thin coating of a hydrocarbon polymer wherein hydrogen atoms of the polymer may be replaced by fluorine atoms to form a multiplicity of (—CF_2—CF_2—) bonds over the cutting edge;

curing the polymer coating to form an adherent thin coating on the cutting edge, said thin coating having a thickness less than about 10,000 Angstrom units; and

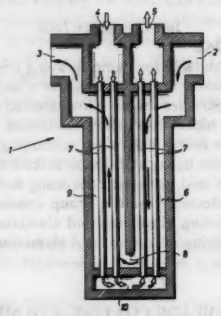
exposing the cured coating to a flow of gaseous fluorine for a predetermined time and at a predetermined temperature to achieve the replacement of the hydrogen atoms by the fluorine atoms to form the multiplicity of (—CF_2—CF_2—) bonds.

4,330,577

HEAT EXCHANGER WALL ELEMENT COMPRISING NATURAL FIBER MATERIAL DRENCHED FIRST WITH A SALT SOLUTION AND THEREAFTER WITH A WATER GLASS BINDER

Axel N. A. Axlander, Floragatan 10, S-114 31 Stockholm, Sweden

Filed Apr. 23, 1980, Ser. No. 142,923
Claims priority, application Sweden, May 21, 1979, 7904440
Int. Cl.³ B05D *1/36;* B32B *1/08;* F28F *13/18, 19/02*
U.S. Cl. 428—36 13 Claims



1. A heat exchanger wall element of porous hygroscopic material consisting of natural fiber material drenched with a salt solution for reducing the freezing point of water, characterized in that said salt-drenched wall element has also been drenched with water glass in order to retain the salt in the pores of said wall element during use thereof.

7. A method of manufacturing a heat exchanger wall element of porous hygroscopic material consisting of natural fiber material, comprising the steps of

(a) first drenching said wall element with a salt solution for reducing the freezing point of water; and then

(b) drenching said wall element with water glass in order to retain the salt in the pores of said element.

4,330,578

SYNTHETIC RESIN DECORATIVE ARTICLE AND PROCESS FOR PRODUCING SAME

Yoshitaka Nishihira, and Harumasa Kato, both of Yokohama, Japan, assignors to Mitsubishi Rayon Co., Ltd., Tokyo, Japan

Filed Oct. 10, 1979, Ser. No. 83,517
Int. Cl.³ A47G *29/10*
U.S. Cl. 428—13 8 Claims

1. A synthetic resin decorative article consisting essentially of two injection molded, superimposed thermoplastic resin bodies and at least one integral layer of a cured thermosetting resin ink in a desired pattern directly printed on one side of one body and fully enclosed within the molded bodies joined together by injection molding, at least one side of said decorative

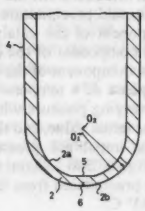
article being transparent so that the cured thermosetting resin ink layer can be seen from the surface of said at least one side.

4,330,579

PARISON FOR BOTTLE PRODUCT

Akiho Ota, and Yoshiaki Hayashi, both of Tokyo, Japan, assignors to Yoshino Kogyosho Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 109,151, Jan. 2, 1980, abandoned. This application Jun. 29, 1981, Ser. No. 278,282
Int. Cl.³ B65D *1/00, 85/70*
U.S. Cl. 428—35 3 Claims



1. A bottomed tubular parison for producing a bottle by biaxial orientation, said parison prepared by injection molding a synthetic resin and comprising:

a tubular drum portion; and

a bottom portion; and wherein:

said bottom portion is of generally semispherical shape and protrudes outwardly of the parison;

a central area of the inner surface of said bottom portion is flattened, the thickness of the flattened portion of the bottom portion having a first thickness at the center thereof and gradually decreasing toward the outer periphery;

the remainder of said bottom portion has a thickness which increases gradually in the direction away from said central area from a second thickness adjacent said central area to a third thickness as it joins smoothly with the side walls of said tubular drum portion, said second thickness being of smaller dimension than said first thickness, such that said bottom portion will have a uniform thickness after biaxial orientation thereof.

4,330,580

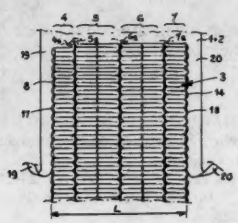
PROCESS FOR MANUFACTURE OF WALL COVERINGS AND WALL COVERINGS THUS OBTAINED

Joël Dalle, Bondues, France, assignor to Dalle & Cie, S.A., Wervicq, France

Division of Ser. No. 8,581, Feb. 1, 1979, Pat. No. 4,297,156. This application Apr. 20, 1981, Ser. No. 255,891
Int. Cl.³ B32B *7/06, 7/08*
U.S. Cl. 428—43 1 Claim

1. A wall covering composed of an element of a textile nature associated with a support of dimensionally indeforma-

ble material on which support the textile element is fixed by the fusion of a film of thermoplastic material interposed between the textile element and the support, the textile element being formed by crocheting with deposit of at least one warp band of threads or meshes in a zigzag having the portion of the warp substantially perpendicular to the direction of advance of the work prefixed in this position by chain stitching parallel to the direction of advance of the work, the textile element being of the exact width of the final covering and stabilized in width



and straightness by the support of width greater than that of the textile element, the textile element being prefixed to the support and film by the chain stitching that positions the portions of the warp, chain stitching along each edge of the warp to prevent the marginal portions of the warp from displacing before being fixed by fusion of the film and providing a line of precutting of the support and of its film to facilitate the ultimate tearing away of the excessive width of the support, and the fused film positively fixing the textile element on the support.

4,330,581

SEALING ELEMENT

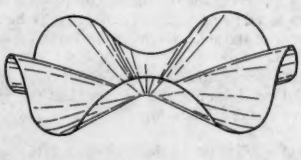
Bernhard Borgert, and Udo Liche, both of Mannheim, Fed. Rep. of Germany, assignors to Braas & Co. GmbH, Frankfurt, Fed. Rep. of Germany

Filed Nov. 5, 1979, Ser. No. 91,565

Claims priority, application Fed. Rep. of Germany, Jul. 18, 1979, 7920530[U]

Int. Cl.³ B32B *3/02*; E04C *1/00*

U.S. Cl. 428—64 **9 Claims**



1. A sealing element made of a water-resistant elastomer or plastomer for outer corners on flat roofs and similar engineering constructions, which comprises a lamelliform structure of substantially circular shape having inclusively from four to six waves distributed radially throughout the structure and around the entire circumference of the structure, the amplitudes of which waves increase regularly from the centre of the structure towards the circumference.

4,330,582

SEMICRYSTALLINE SILICON PRODUCTS

Joseph Lindmayer, Bethesda, Md., assignor to Semix Incorporated, Gaithersburg, Md.

Division of Ser. No. 959,982, Nov. 13, 1978, Pat. No. 4,256,681, which is a continuation of Ser. No. 751,342, Dec. 16, 1976, abandoned. This application Mar. 19, 1980, Ser. No. 131,820

Int. Cl.³ C01B *33/00*

U.S. Cl. 428—64 **6 Claims**

1. A semicrystalline silicon wafer composed of randomly arranged silicon grains, such grains at least at one surface of the wafer having a mean diameter of at least about one mm. and abutting each other at the boundaries of the grains, said grains at their interiors being composed of silicon of relatively high crystallographic order when compared with the silicon at the grain boundaries, said grains being distributed in substantially non-columnar, non-linear fashion in said wafer.

4,330,583

HIGH DENSITY INFORMATION RECORD LUBRICANTS

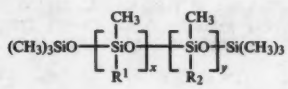
Pabitra Datta, Cranbury, and Eugene S. Poliniak, Willingboro, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Feb. 5, 1981, Ser. No. 231,857

Int. Cl.³ B32B *3/02*

U.S. Cl. 428—65 **5 Claims**

1. In a high density information record adapted for use with a playback stylus to effect recovery of signals occupying a bandwidth of at least several megahertz when relative motion at a desired rate is established between said record and said stylus, said record comprising a disc of a conductive material containing an information track constituted by a surface relief pattern in said track to accommodate recovery of signals of said bandwidth upon establishment of relative motion at said rate, said record coated wtih a methylalkylsiloxane lubricant having the formula



wherein R_1 and R_2 are alkyl groups of 4–20 carbon atoms, x is an integer of 2–4, y is an integer of 0–2 and wherein the sum of x plus y is 4 or less, the improvement which comprises adding to said lubricant an hydroxylated amine compound of the formula

wherein R_3 is hydrogen, lower alkyl or hydroxyalkyl; R_4 is R_6A wherein R_6 is an alkyl group of 1–5 carbon atoms and A is hydroxyl or carboxyl; R_5 can be R_7A wherein R_7 is a straight chain alkyl group of 1–10 carbon atoms and A has the meaning given above or can be $R_7A\text{-}B\text{-}R_8$ wherein R_7 and A have the meanings given above, B is a linking group which can be —O— or —C=C— and R_8 is an alkyl group of from about 6–25 carbon atoms.

4,330,584

AUTOMOTIVE LINER PANEL

Richard P. Doerer, Grosse Pointe, Mich., assignor to Van Dresser Corporation, Troy, Mich.

Division of Ser. No. 886,137, Mar. 13, 1978, Pat. No. 4,172,918, which is a continuation-in-part of Ser. No. 592,611, Jul. 2, 1975, abandoned. This application Sep. 25, 1979, Ser. No. 78,775

The portion of the term of this patent subsequent to Feb. 12, 1997, has been disclaimed.

Int. Cl.³ B32B *3/26, 5/14, 5/20*

U.S. Cl. 428—91 **6 Claims**

1. A laminated, self-supporting, automotive panel of predetermined contour consisting of an outer substrate layer of expanded polystyrene which is relatively rigid and has a substantial resistance to bending, an intermediate layer of relatively soft, compressible, flexible urethane foam fused to one side of said substrate layer in direct surface-to-surface contact therewith, said intermediate layer being of sufficient thickness to provide heat and sound insulation, to provide a soft feel and to conceal imperfections in said substrate layer, and an outer

flexible decorative finish cover layer fused to the side of said intermediate layer opposite said substrate layer in direct surface-to-surface contact therewith.

4. The automotive panel defined in claim 1, wherein said substrate layer has a thickness of 0.150"–0.180" and a density of

4 pounds per cubic foot, and said intermediate layer has a thickness of 0.060"–0.500" and a density of 1 to 4 pounds per cubic foot.

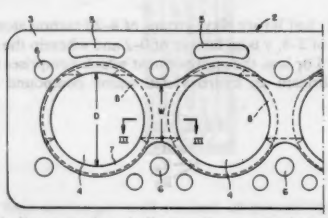
5. The automotive panel defined in claim 4, wherein said cover layer is cloth of a tricot type construction which has been knitted, dyed, and then napped for finished appearance.

4,330,585

CYLINDER-HEAD GASKET AND METHOD OF MAKING SAME

Pierre Eyrard, Lyons, and Jean-Paul Poquet, Caluire, both of France, assignors to Curty, Société Anonyme, Saint-Priest, France

Filed Oct. 30, 1980, Ser. No. 202,233
Claims priority, application France, Oct. 31, 1979, 79 27394
Int. Cl.³ B32B *3/10*; F16J *15/12*
U.S. Cl. 428—131 **12 Claims**



1. A cylinder-head gasket comprising:

an elongated compressible heat-resistant sheet having a longitudinally extending succession of circular cylinder holes having edges;

respective U-section sheet-metal rings gripped over said edges of said holes of said sheet; and

respective sections of reinforcement material engaged between said rings and said sheet in a longitudinally extending central region of said sheet having a width smaller than the diameter of said cylinder holes, said material being different from the sheet metal of said rings and heat resistant.

4,330,586

MEANS AND METHOD OF RESTORING DOCUMENTS, PAINTINGS AND THE LIKE

Robert E. Fieux, 263 Cedar St., West Barnstable, Mass. 02668

Continuation of Ser. No. 1,483, Jan. 8, 1979, abandoned, which is a division of Ser. No. 856,772, Dec. 2, 1977, Pat. No. 4,156,399. This application May 22, 1980, Ser. No. 152,168
Int. Cl.³ B32B *5/18, 5/26*
U.S. Cl. 428—196 **3 Claims**

1. In combination, a paint canvas having a paint film thereon, a porous, flexible substrate layer of a fine woven polyester or fiberglass mesh fabric material, a silicon pressure sensitive adhesive layer, one on each side of the substrate layer, one of said adhesive layers also attached to the rear surface of the paint canvas, said layers all being of about the same area as the paint canvas, and a lining cloth having a canvas like appearance that is porous and flexible and secured to the other adhesive layer on the substrate layer.

4,330,587

METAL-THERMOPLASTIC-METAL LAMINATES

James C. Woodbrey, Chesterfield, Mo., assignor to Monsanto Company, St. Louis, Mo.

Filed Feb. 23, 1981, Ser. No. 236,962
Int. Cl.³ B32B *7/02, 15/08*
U.S. Cl. 428—215 **10 Claims**

1. A metal-thermoplastic-metal laminate comprising:

(a) a thermoplastic core layer of thickness from about 0.01 inches to about 0.09 inches, said thermoplastic being selected from the group consisting of partly crystalline polyamides and polyesters having a crystalline melting point greater than about 130° C. and a tensile elongation greater than 15 percent;

(b) a metal layer of thickness from about 0.002 inches to about 0.0085 inches laminated on each side of the thermoplastic core layer, said metal being an aluminum alloy selected from the group consisting of

(i) aluminum alloys which have at least 90 weight percent aluminum, from about 0.4 to about 1.6 weight percent manganese and from 0 to about 1.3 weight percent magnesium, the weight percent of any other alloy metal being less than that of the manganese;

(ii) aluminum alloys which have at least 90 weight percent aluminum and from from about 1.2 to about 5.3 weight percent magnesium, the weight percent of any other alloy metal being less than that of the magnesium;

(iii) aluminum alloys which have at least 90 weight percent aluminum, from about 0.3 to about 1.3 weight percent magnesium and from about 0.2 to about 1.5 weight percent silicon, the weight percent of any other alloy metal being less than either that of the magnesium or that of the silicon, whichever is the greater;

provided that,

(A) the thermoplastic core layer thickness is less than $(0.54-14t_f)/d_c$ inches and greater than the value for t_m required in the relationship

$$(t_m+t_f)^2+[(E_c\times 10^{-7})-1]t_m^3/(t_m+t_f)=25/(S-2000);$$

(B) the tensile offset yield strength of said metal is greater than 15,000 lbs./in.^{2} and at least

$$2000+\frac{2600}{(t_c d_c+14t_f)^2}\ \text{lbs./in.}^2;$$

and

(C) the tensile elongation of said metal is at least

9.5 percent for said (i) aluminum alloys,

14.0 percent for said (ii) aluminum alloys,

10.0 percent for said (iii) aluminum alloys;

wherein,

d_c is the density of the thermoplastic core layer in lbs./ft.^{2}-in.,

t_c is the thickness of the core layer in inches,

t_f is the sum of the thicknesses of the two metal layers in inches,

t_m is the minimum acceptable core thickness,

E_c is the Young's modulus of the thermoplastic core in lbs./in.^{2},

S is the average tensile offset yield strength of the two metal layers in lbs./in.^{2}.

4,330,588

PROCESS FOR MODIFYING THE SURFACES OF POLYESTER FIBERS

Wayne K. Larson, Maplewood; Michael M. Lynn, White Bear Lake, and E. Steven McAllister, St. Paul, all of MN, assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed May 2, 1980, Ser. No. 146,149
Int. Cl.^{3} B05D *3/02*; B32B *7/00, 23/00, 27/00*
U.S. Cl. 428—264 **25 Claims**

1. A shaped essentially polyester article which is provided with a surface-modification to provide said article with stain-release properties, said surface-modification comprising the application of a polyester polymer to said surface, said polymer having become locked into and onto said article by application in an aqueous swelling environment of at least 35° C. and remaining in and on said polyester article after 5 washing cycles in an aqueous detergent bath and comprising a water-dispellable non-crystalline polyester polymer having a molecular weight of about 700–50,000 and containing substantially equimolar amounts of the residues of

a. 100 mole percent of dicarboxylic acids consisting essentially of

1. 0 to 65 mole percent aliphatic dicarboxylic acids have at least two carbon atoms between carbonyl groups and having an average of 4 to 10 carbon atoms,
2. 30 to 90 mole percent unsulfonated aromatic dicarboxylic acids of which at least 30 but no more than 70 mole percent is terephthalic acid,
3. 5 to 60 mole percent of aliphatic or aromatic dicarboxylic acids having 4 to 12 carbon atoms and having one sulfonic acid or sulfinci acid salt group, and

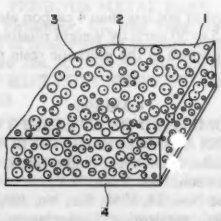
b. 100 mole percent of glycols consisting essentially of aliphatic glycols containing 2 to 10 carbon atoms and up to 4 non-peroxidic catenary oxygen atoms, of which glycols at least 30 mole percent is ethylene glycol.

4,330,589

FOAMED GYPSUM MOULDED ARTICLES AND PRODUCTION THEREOF

Masumi Saito, Kobe; Eiichi Hirai, Takarazuka; Masao Endo, Nishinomiya, and Toru Nishino, Hirakata, all of Japan, assignors to Kurashiki Boseki Kabushiki Kaisha, Kurashiki, Japan

Filed May 12, 1981, Ser. No. 262,916
Claims priority, application Japan, May 15, 1980, 55/65060
Int. Cl.^{3} B32B *3/00, 5/20, 13/00, 13/04*
U.S. Cl. 428—312.4 **11 Claims**



1. A foamed gypsum moulded article comprising a plurality of isolated cells, the cell walls of which have fine, intercell connecting passages.

7. The foamed gypsum moulded article according to claim 1, wherein the foamed gypsum moulded article is formed on face or back sheet material.

4,330,590

PHOTOACTIVE MIXTURE OF ACRYLIC MONOMERS AND CHROMOPHORE-SUBSTITUTED HALOMETHYL-2-TRIAZINE

George F. Vesley, Hudson, Wis., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

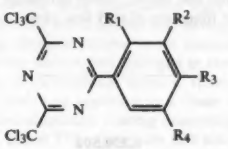
Filed Feb. 14, 1980, Ser. No. 121,404
Int. Cl.^{3} C08F *2/50, 4/00*
U.S. Cl. 428—336 **23 Claims**

1. Method comprising the steps of

(1) mixing by weight

(a) 100 parts of a composition or a polymer of 50–100 parts of acrylic monomer and 0–50 parts of copolymerizable monoethylenically unsaturated monomer and

(b) 0.01 to 2 parts of a chromophore-substituted halomethyl-s-triazine of the formula



wherein R_1, R_2, R_3, and R_4 are independently hydrogen or alkoxy groups, and 1 to 3 of R_1, R_2, R_3, and R_4 are hydrogen,

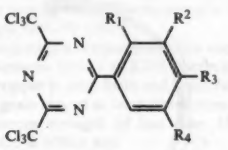
(2) applying the mixture to a substrate,

(3) exposing the applied mixture to ultraviolet radiation.

10. A substrate having a coating comprising a photopolymerized mixture which comprises by weight

(a) 100 parts of acrylic monomer and 0–50 parts of copolymerizable monoethylenically unsaturated monomer and

(b) 0.01 to 2 parts of a chromophore-substituted halomethyl-s-triazine of the formula



wherein R_1, R_2, R_3, and R_4 are independently hydrogen or alkoxy groups, and 1 to 3 of R_1, R_2, R_3, and R_4 are hydrogen.

4,330,591

WOOL-LIKE YARN WITH MOISTURE TRANSPORT

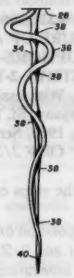
Lawrence E. Blackmon, Foley, Ala.; John R. Dees, and Wayne T. Mowe, both of Pensacola, Fla., assignors to Fiber Industries, Inc., Charlotte, N.C.

Continuation-in-part of Ser. No. 92,395, Nov. 8, 1979, abandoned, which is a division of Ser. No. 972,131, Dec. 21, 1978. This application Nov. 10, 1980, Ser. No. 205,207
Int. Cl.^{3} D02G *3/00*
U.S. Cl. 428—369 **4 Claims**

1. A multifilament yarn comprising first and second classes of filaments;

a. each of said first class of filaments being polyester and having shrinkage profiles in the form of shrinkage peaks and valleys along their lengths, said shrinkage peaks and valleys being out of phase from filament to filament and having amplitudes and spacings along each of said fila-

ments of said first class selected such that said yarn has a crimp above 2%;



b. each of said second class of filaments having a spiral cross-section and having lower shrinkage than the shrinkage of said filaments of said first class.

4,330,592

COMPOSITE MATERIALS OF STEEL CORDS AND RUBBER AND A METHOD OF PRODUCING THE SAME

Takehiro Tsukamoto, Higashimurayama; Michitaka Takeshita, Mitaka, and Seisuke Tomita, Higashimurayama, all of Japan, assignors to Bridgestone Tire Company Limited, Tokyo, Japan

Filed Jul. 7, 1980, Ser. No. 166,515
Claims priority, application Japan, Jul. 6, 1979, 54-857241
Int. Cl.³ B60C 9/00
U.S. Cl. 428—378 2 Claims

1. A composite material of steel cords and rubber having improved corrosion fatigue resistance and fretting fatigue resistance, comprising on a surface of said steel cord a protect layer of a rust preventing material comprising at least one surfactant selected from the group consisting of metal salts of organic carboxylic acids containing magnesium, calcium or barium as a metal, metal salts of organic sulfonic acids containing magnesium, calcium or barium as a metal, metal salts of organic sulfates containing magnesium or calcium as a metal, metal salts of hydrocarbon polymer oxides containing magnesium, calcium or barium as a metal and sorbitan fatty acid esters, and at least one film-former selected from the group consisting of hydrocarbon polymers and oxides thereof having a softening or melting point of not less than 30° C. before vulcanization bonding of rubber to said steel cords.

4,330,593

PZT/POLYMER COMPOSITES AND THEIR FABRICATION

Thomas R. Shrout, Erie; Walter A. Schulze, and James V. Biggers, both of State College, all of Pa., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Nov. 13, 1980, Ser. No. 206,732
Int. Cl.³ B32B 5/16; B05D 5/12; B32B 15/08; H04R 17/00
U.S. Cl. 428—407 6 Claims

4. PZT/polymer composites for fabricating acoustic transducers which comprise:

a commercially available powder thoroughly mixed with a plurality of polymethyl methacrylate (PMM) spheres and polyvinylalcohol formed and sintered into a plurality of porous pellets;

lead zirconate added to said plurality of porous pellets; and

a polymer impregnated into said plurality of porous pellets containing lead zirconate.

4,330,594

SURFACE PROTECTION FOR PARTS OF A HOT-TINNING SYSTEM

Kurt Schneider, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Mar. 28, 1980, Ser. No. 135,071
Claims priority, application Fed. Rep. of Germany, Apr. 5, 1979, 2913805
Int. Cl.³ B05C 11/06
U.S. Cl. 428—422 8 Claims

1. A surface protection for surfaces of air jets of a hot-tinning system, said protection being provided on surfaces of air jets coming into contact with a solder during a hot-tinning process, said air jet surfaces being provided with a non-metallic, heat resistant layer selected from a group consisting of Al_2O_2 ceramic layer and polytetrafluoroethylene layer.

4,330,595

METHOD FOR PROTECTING CEMENTWARE FROM FROST-DAMAGE

Michio Tanaka, Takatsuki; Kohji Nasu, and Tetsuaki Kanemoto, both of Nishinomiya, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Filed Mar. 24, 1980, Ser. No. 133,291
Claims priority, application Japan, Mar. 26, 1979, 54/35791
Int. Cl.³ B32B 13/12, 27/40
U.S. Cl. 428—425.5 7 Claims

1. A method of protecting cementware from frost-damage, which comprises coating the cementware with a moisture-cure type urethane resin coating impregnated with a web-like or three-dimensionally structured organopolysiloxane compound represented by the rational formula:

$$R_2Si_2O_3$$

wherein R is alkyl of not less than 4 carbon atoms or hydroxyalkyl of about 0.5 to 50 parts by weight relative to 100 parts by weight of resin portion in the urethane resin coating.

4,330,596

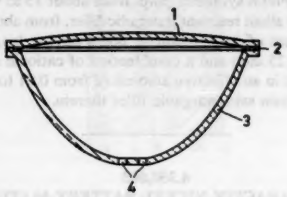
BODIES COMPOSED OF AT LEAST TWO PARTS, SEALING GLASS AND METHOD FOR BONDING PARTS

Paul J. Van Assche, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 24, 1980, Ser. No. 209,794
Claims priority, application Netherlands, Nov. 22, 1979, 7908501
Int. Cl.³ B32B 17/06; C03C 3/14
U.S. Cl. 428—428 4 Claims

1. Bodies composed of at least two parts produced of a glass or a ceramic material having a coefficient of thermal expansion

$\alpha_{30°-300°\ C.}$ in the range 31 to 36×10^{-7} per °C., these parts having been sealed together by means of a sealing glass having a coefficient of expansion of less than 40×10^{-7} per °C. characterized in that the sealing glass consists essentially of 8–10



weight % vanadium pentoxide, 1.5–3.0 weight % copper (II) oxide, 1–3 weight % lead (II) oxide, 0–1 weight % silicon (IV) oxide, 0–5 weight % aluminium oxide, 26–28 weight % boron (III) oxide and 58–61 weight % zinc oxide, the weight ratio boron oxide to zinc oxide being from 0.45 to 0.47.

4,330,597

PROCESS FOR DRESSING LEATHER BY A TREATMENT USING RUBBER LATICES

Ferdinand Heins, Erkrath; Leo Tork, Leverkusen, and Wolfgang Höhne, Bergisch Gladbach, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Nov. 12, 1980, Ser. No. 206,069

Claims priority, application Fed. Rep. of Germany, Nov. 17, 1979, 2946435

Int. Cl.[3] **B05D** *3/02, 3/12;* **B32B** *9/02;* **C14C** *9/00*

U.S. Cl. 428—473 **7 Claims**

1. A process for dressing leather with a synthetic rubber latex which is reacted with from 0.5 to 50% by weight, based on solid rubber, of one or more oxides and/or hydroxides of one or more bivalent metals and also treating the leather with a non-polymerized rubber latex which is produced in a one-stage process up to a monomer conversion of from 70 to 95% by weight, by emulsion polymerization of:

(A) from 1 to 10 parts by weight of one or more α, β monoethylenically unsaturated aliphatic carboxylic acids; and ethylenically unsaturated aliphatic carboxylic acids; and

(B) from 90 to 99 parts by weight of a mixture of:

(a) from 10 to 90 parts by weight of butadiene

(b) from 10 to 90 parts by weight of styrene and/or acrylonitrile, whereby the quantity of acrylonitrile in the mixture amounts to a maximum of 50 parts by weight.

4,330,598

REDUCTION OF LOSS OF ZINC BY VAPORIZATION WHEN HEATING ZINC-ALUMINUM COATINGS ON A FERROUS METAL BASE

Harvie H. Lee, Flossmoor, Ill., and Yong-Wu Kim, Munster, Ind., assignors to Inland Steel Company, Chicago, Ill.

Filed Jun. 9, 1980, Ser. No. 157,373

Int. Cl.[3] **B32B** *15/18;* **B05D** *1/10, 1/28, 3/02*

U.S. Cl. 428—653 **10 Claims**

1. A corrosion and oxidation resistant zinc-aluminum coated low-alloy ferrous metal strip comprising; a low-alloy low-carbon steel strip containing between about 0.03 to 0.1 wt.% carbon having titanium as an essential alloying element in an amount which combines with all the carbon and nitrogen in the steel and provides an excess of uncombined metallic titanium distributed throughout the steel, said strip having a hot-dip zinc-aluminum surface coating consisting essentially of between about 43 wt.% zinc and about 55 wt.% aluminum and about 2 wt.% silicon, and said coating being resistant to the loss of zinc from the coating when the coating is heated at a temperature above the melting point of zinc to between about 427° C. (800° F.) and about 816° C. (1500° F.).

6. A method of providing a corrosion and oxidation resistant hot-dip zinc-aluminum coated ferrous metal strip which resists loss of zinc from a zinc-aluminum coating containing about 43 wt.% zinc and 55 wt.% aluminum when said coating is heated at a temperature above the melting point of zinc to between about 427° C. (800° F.) and 816° C. (1500° F.) which comprises;

forming a strip of low alloy low carbon steel containing between about 0.03 to 0.1 wt.% carbon and having titanium as an essential alloying element present in an amount which combines with all of the carbon and nitrogen in the steel and providing an excess of uncombined metallic titanium distributed throughout the steel, and applying to a clean surface of said strip a hot-dip zinc-aluminum coating consisting essentially of about 43% zinc, about 55% aluminum and about 2 wt.% silicon.

4,330,599

COMPOSITE MATERIAL

Joseph Winter, New Haven; William Brenneman, Cheshire, and Julius C. Fister, Hamden, all of Conn., assignors to Olin Corporation, New Haven, Conn.

Filed Jun. 9, 1980, Ser. No. 157,997

Int. Cl.[3] **B32B** *15/20*

U.S. Cl. 428—675 **12 Claims**

1. A composite material having a substantially smooth external surface and a gold color comprising:

a core comprising copper core material in strip form in a hard temper having an initial strength of at least 51,000 psi yield strength at 0.2% offset;

a cladding comprising a copper base alloy containing from 2 to 3.5% aluminum, from 1 to 2.5% silicon and the balance essentially copper in strip form and being fully annealed to an average grain size of at least 10 microns and having an initial maximum strength of less than 15,000 psi yield strength at 0.2% offset; and

a strong metallurgical bond between said core and said cladding capable of being bent 90° and returned without delamination and without substantial interatomic diffusion, said bond being formed by rolling together said core in an unheated condition and said cladding in a single pass with a reduction of 50% to 75% so that said composite has substantially no surface waviness and said substantially smooth external surface.

8. A composite metal laminate useful in making coins and having a gold color comprising:

a core comprising copper core material in strip form in a hard temper having an initial strength of at least 51,000 psi yield strength at 0.2% offset;

a cladding comprising a copper base alloy containing from 2 to 3.5% aluminum, from 1 to 2.5% silicon and the balance essentially copper in strip form and being fully annealed to an average grain size of at least 10 microns and having an initial maximum strength of less than 15,000 psi yield strength at 0.2% offset; and

a strong metallurgical bond between said core and said cladding capable of being bent 90° and returned without delamination and without substantial interatomic diffusion, said bond being formed by rolling together said core

in an unheated condition and said cladding in a single pass with a reduction of 50% to 75% so that said composite laminate has substantially no surface waviness and a substantially smooth external surface.

4,330,600

MAGNETIC RECORDING MEDIUM

Kouichi Kawasumi; Haruo Watanabe, and Junetsu Seto, all of Kanagawa, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Oct. 8, 1980, Ser. No. 195,005
Claims priority, application Japan, Oct. 13, 1979, 54-132196
Int. Cl.³ H01F *10/10*
U.S. Cl. 428—694 5 Claims

1. A magnetic recording medium comprising a non-magnetizable base, and a magnetic layer formed thereon containing magnetizable particles and a resinous binder, said magnetic layer including a reaction product between a metallic hydroxide and a titanium compound having the grouping:

where Ti is tetravalent titanium atom bonded to an alkoxy group, X, Y and Z are difficultly hydrolyzable oleophilic groups containing a hydrocarbon chain of from 1 to 50 carbon atoms, and a, b and c are integers of from 0 to 3, with a plus b plus c totalling from 1 to 3.

4,330,601

RECHARGEABLE NONAQUEOUS SILVER ALLOY ANODE CELL

Arabinda N. Dey, Needham, Mass., assignor to Duracell International Inc., Tarrytown, N.Y.

Division of Ser. No. 81,250, Oct. 1, 1979. This application Feb. 27, 1981, Ser. No. 238,719
Int. Cl.³ H01M *10/40*
U.S. Cl. 429—105 9 Claims

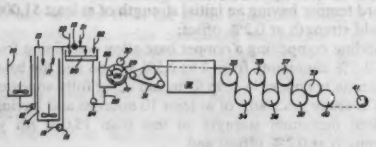
1. A secondary electrochemical cell comprising a solid anode, an electrolyte and a cathode operatively associated, therewith said anode comprising a solid solution of silver and a metal selected from the group consisting of alkali and alkaline earth metals, wherein said metal is capable of forming a solid solution with said anode on the recharging of said anode.

4,330,602

BATTERY SEPARATOR

Dennis D. O'Rell, Boxborough, Mass.; Nguyen V. Hien, East Windsor, N.J.; Joseph T. Lundquist, Jr., Columbia, and Christian B. Lundsager, Ashton, both of Md., assignors to W. R. Grace & Co., New York, N.Y.

Continuation-in-part of Ser. No. 57,412, Jul. 13, 1979, Pat. No. 4,264,691. This application Jul. 17, 1980, Ser. No. 169,906
The portion of the term of this patent subsequent to Apr. 28, 1998, has been disclaimed.
Int. Cl.³ H01M *2/16*
U.S. Cl. 429—206 18 Claims



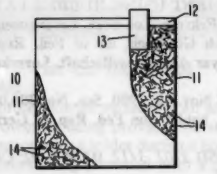
1. In an alkaline battery system having at least one positive electrode, at least one negative electrode, an alkaline electrolyte and at least one sheet membrane positioned between positive and negative electrode pairs, wherein the improvement comprises having between each positive and negative electrode pair at least one of said membranes in the form of a sheet material of less than about 10 mils thickness formed from a substantially uniform mixture of from about 30 to 70 weight percent polyolefin synthetic pulp, from about 15 to 65 weight percent of an alkali resistant inorganic filler, from about 1 to 35 weight percent of long synthetic fibers having lengths of at least about 0.25 inch and a combination of cationic agent and anionic agent in an effective amount of from 0.01 to 1 weight percent to retain said inorganic filler therein.

4,330,603

HIGH CAPACITY NICKEL BATTERY MATERIAL DOPED WITH ALKALI METAL CATIONS

John F. Jackovitz, Monroeville, and Earl A. Pantier, Penn Hills, both of Pa., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jan. 29, 1981, Ser. No. 229,360
Int. Cl.³ H01M *4/32*
U.S. Cl. 429—206 5 Claims



1. A pre-formed battery material consisting essentially of: (A) about 60 wt. % to about 95 wt. % of hydrated $Ni(OH)_2$, and (B) about 5 wt. % to about 40 wt. % of Ni(IV) hydrated oxide interlayer doped with from about 0.2 atom % to about 2.0 atom % of alkali metal cation, selected from the group consisting of potassium cation, sodium cation and lithium cation, said battery material being made by contacting a slurry of hydrated $Ni(OH)_2$ which contains alkali metal cation, selected from the group consisting of potassium cation, sodium cation and lithium cation, with an ozone-air or ozone-oxygen gas mixture at a pressure over atmospheric, where the cation in the interlayer of the Ni(IV) hydrated oxide is the same as the cation contained in the slurry of hydrated $Ni(OH)_2$.

4,330,604

FABRICATION OF HOLOGRAMS ON PLASTIC SUBSTRATES

John E. Wreede, Monrovia; Andrejs Graube, Marina Del Rey, and Mark A. Mulvihill, Redondo Beach, all of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

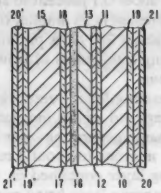
Filed Aug. 4, 1980, Ser. No. 174,950
Int. Cl.³ G03C *1/84*
U.S. Cl. 430—2 37 Claims

1. A process for fabricating a pre-holographic element supported on an optically transparent hydrophobic substrate which comprises:

(a) forming a layer of a polycrystalline, optically transparent, moisture barrier material on at least a portion of the hydrophobic substrate by a process which generates a temperature at the substrate of less than that of its softening point at which it deforms;

(b) forming a layer of a hydrophilic, polar material on at least a portion of the moisture barrier layer by a process

which generates a temperature at the substrate less than that of its softening point; and



(c) forming a layer of a hydrophilic, photosensitive material on at least a portion of the layer of hydrophilic, polar material.

4,330,605
PHOTOLITHOGRAPHIC RECEPTOR SHEET

David R. Boston, Woodbury, Minn., assignor to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Filed Jan. 21, 1981, Ser. No. 226,617
Int. Cl.³ G03C *5/54*; G03F *7/02*
U.S. Cl. 430—14 **16 Claims**

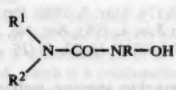
1. A photolithographic receptor sheet capable of being imaged by a silver salt diffusion transfer process, comprising a support having coated thereon a hydrophilic composition consisting essentially of a mixture of colloidal silica and a dry hydrophilic powder, said powder having an average particle size of from about 80 to about 400 times greater than the particle size of said colloidal silica, said powder being present at a weight ratio to said colloidal silica of from about 0.25 to 1 to about 1 to 1; and overlying said hydrophilic layer a coating comprising catalytic silver precipitating nuclei.

4,330,606
COLOR PHOTOGRAPHIC MATERIALS AND COLOR PHOTOGRAPHIC IMAGES

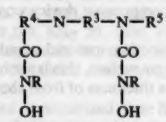
Johannes Sobel, Leverkusen, and Karl-Wilhelm Schranz, Odenthal, both of Fed. Rep. of Germany, assignors to AGFA-Gevaert AG, Leverkusen, Fed. Rep. of Germany

Filed Sep. 4, 1980, Ser. No. 184,035
Claims priority, application Fed. Rep. of Germany, Sep. 8, 1979, 2936429
Int. Cl.³ G03C *1/40, 7/00*
U.S. Cl. 430—17 **4 Claims**

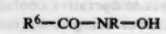
1. Light sensitive photographic material comprising a support layer and at least one hydrophilic layer of binder containing a colour coupler for producing a dye image, wherein the material contains in an emulsified form at least one of the following compounds, I, II or III, which are insoluble in alkali solutions,



I



II



III

in which

R represents hydrogen or an alkyl group;

R^1 represents hydrogen or an alkyl, cycloalkyl, aralkyl or aryl group;

R^2 represents an alkyl, cycloalkyl, aralkyl or aryl group;

R^3 represents a divalent hydrocarbon group;

R^4, R^5 which may be the same or different represent hydrogen or an alkyl group;

R^6 represents an alkyl with 7 to 11 carbon atoms, cycloalkyl, aralkyl or aryl group; and/or

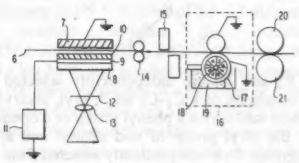
R^1 and R^2 may together represent the atoms required to complete a heterocyclic ring and/or

R^3 together with R^4 and optionally R^5 may represent the atoms required to complete a heterocyclic ring, under the condition that when R^1 and R^2 together form a heterocyclic ring, this has at least 7 carbon atoms and that otherwise R^1 and R^2 together have at least 10 carbon atoms.

4,330,607
METHOD FOR FORMING AN ELECTROSTATIC LATENT IMAGE

Akiyoshi Kouno, Tokyo, Japan, assignor to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Aug. 28, 1979, Ser. No. 71,342
Claims priority, application Japan, Sep. 1, 1978, 53/107785
Int. Cl.³ G03G *13/04*
U.S. Cl. 430—48 **15 Claims**



1. A method for forming an electrostatic latent image on an electrostatic recording medium placed between a photoconductive layer disposed on a first electrode and a second electrode, said electrostatic recording medium having a minimum recording threshold voltage with respect to an amount of exposure, said method comprising the step of (1) placing said electrostatic recording medium between said photoconductive layer and said second electrode, (2) thereafter projecting a first optical image onto said photoconductive layer while applying a first voltage lower than said minimum recording threshold voltage and higher than 100 V between said first and second electrodes such that no electrostatic latent image is formed on said electrostatic recording medium, and (3) immediately thereafter projecting a second optical image onto said photoconductive layer while applying a second voltage higher at least in its peak value than the recording threshold voltage at any exposure between said first and second electrodes so that said second optical image is formed on said electrostatic recording medium as said electrostatic latent image.

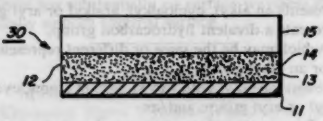
4,330,608
BENZOTRIAZOLE STABILIZED PHOTOSENSITIVE DEVICE

William W. Limburg, Penfield, and Damodar M. Pai, Fairport, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

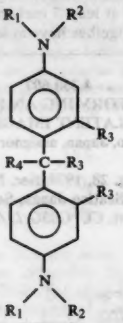
Continuation of Ser. No. 69,472, Aug. 24, 1979, abandoned. This application Dec. 11, 1980, Ser. No. 215,476
The portion of the term of this patent subsequent to Nov. 4, 1997, has been disclaimed.
Int. Cl.³ G03G *5/14*
U.S. Cl. 430—59 **5 Claims**

1. In an imaging member comprising a hole generation layer and a contiguous hole transport layer, said generation layer comprising a photoconductive material exhibiting the capabil-

ity of photogeneration of holes and injection of said holes, said



hole transport layer comprising a di or triarylmethane compound of the general formula:



wherein R_1 and R_2 are independently selected from the group consisting of a C_1–C_8 alkyl, aryl, alkaryl and aralkyl, where said aryl is a phenyl group or a condensed ring group, the alkyl group of said alkaryl and aralkyl is a C_1–C_4 group; R_3 is independently selected from the group consisting of hydrogen and CH_3; and R_4 is the same as R_1 and R_2 or a disubstituted aminophenyl group wherein the substituents are independently selected from the group consisting of a C_1–C_8 alkyl, aryl, alkaryl and aralkyl, said di or triarylmethane is dissolved in a polycarbonate resinous material in a proportion of about 25–75% by weight, said charge transport layer being substantially nonabsorbing in the spectral region at which the photoconductive material generates and injects said holes, but being capable of supporting the injection of said holes and transporting said holes through said transport layer, the improvement consisting of stabilizing said triarylmethane compound against the deleterious effects of ultraviolet light by the presence in said transport layer of a stabilizing proportion of a substituted or unsubstituted 2-(2'-hydroxyphenyl)-benzotriazole.

4,330,609

METHOD OF IMAGING A TRAPPING LAYER OVERCOATED INORGANIC PHOTORESPONSIVE DEVICE

James H. Neyhart; George A. Brown, both of Penfield; Lloyd A. Relyea, Webster; Merlin E. Scharfe, and Heinz W. Pinsler, both of Penfield, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Division of Ser. No. 127,177, Mar. 5, 1980, Pat. No. 4,286,033. This application May 11, 1981, Ser. No. 262,094

Int. Cl.³ G03G *13/22, 13/16*

U.S. Cl. 430—126 **4 Claims**

1. An electrophotographic imaging method comprising providing a photoresponsive device which is comprised of

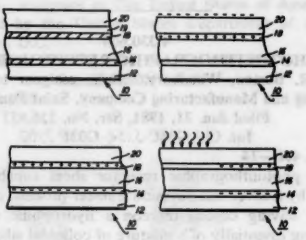
(a) a substrate;

(b) a layer of hole injecting material capable of injecting holes, this layer being comprised of trigonal selenium, the hole injecting layer having a thickness of from about 0.5 microns to about 10 microns;

(c) a hole transport layer in operative contact with the hole injecting layer, this layer being comprised of a halogen doped selenium arsenic alloy, where in the percentage by weight of selenium present is from about 99.5 percent to about 99.9 percent, the percentage by weight of arsenic present is from about 0.1 percent to about 0.5 percent, and the halogen is present in an amount of from about 10 parts per million, to about 200 parts per million, the hole transport layer having a thickness of from about 5 microns to about 60 microns;

(d) a charge generating layer overcoated on the hole transport layer comprised of an inorganic photoconductive material, the charge generating layer having a thickness of from about 0.1 microns to about 5 microns;

(e) a hole trapping layer contained on the generating material, the hole trapping layer being comprised of a halogen doped selenium arsenic alloy wherein the amount of selenium present by weight ranges from about 95 percent to about 99.9 percent, the amount of arsenic present ranges



from about 0.1 percent to about 5 percent, and the amount of halogen present ranges from about 10 parts per million to 200 parts per million, the hole trapping layer having a thickness of from about 0.01 microns to about 5 microns, and

(f) a layer of electrically insulating organic resin overlaying the hole trapping layer, charging the said device with negative electrostatic charges, followed by charging said device with positive electrostatic charges in order to substantially neutralize the negative charges residing on the surface of the device, followed by exposing the device to an imagewise pattern of electromagnetic radiation to which the charge carrier generating material is responsive, whereby there is formed an electrostatic latent image on the photoresponsive device, and developing said latent image with toner and optionally transferring said toner to a permanent substrate.

4,330,610

METHOD OF IMAGING OVERCOATED PHOTORECEPTOR CONTAINING GOLD INJECTING LAYER

Harvey J. Hewitt, Williamson, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Division of Ser. No. 127,174, Mar. 5, 1980, Pat. No. 4,297,424. This application Jun. 4, 1981, Ser. No. 270,421

Int. Cl.³ G03G *13/22, 13/16*

U.S. Cl. 430—126 **3 Claims**

1. An electrophotographic imaging method which comprises subjecting a photoresponsive device consisting of

(a) a substrate;

(b) a layer of hole injecting material capable of injecting holes into a layer on its surface, this layer being comprised of gold, and having a thickness of from about 0.02 microns to about 10 microns;

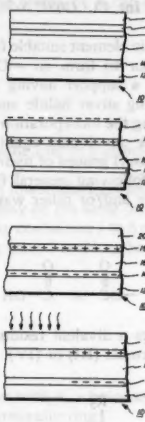
(c) a hole transport layer in operative contact with the hole injecting layer, this layer being comprised of a halogen doped selenium-arsenic alloy wherein the percentage of selenium present by weight is from about 99.5 percent to about 99.9 percent, the percentage of arsenic present by

weight is from about 0.5 percent to about 0.1 percent, and the halogen is present in an amount of from about 10 parts per million, to about 200 parts per million;

(d) a charge generating layer overcoated on the hole transport layer, consisting of an inorganic photoconductive material, the charge generating layer having a thickness of from about 0.1 micron to about 5 microns;

(e) an electrically insulating organic resin overlaying the charge generating layer; and

(f) a hole trapping layer situated between the generating layer and the overcoating layer, said trapping layer having a thickness of from about 0.05 microns to about 5



microns and being comprised of inorganic materials selected from selenium, selenium alloys, and halogen doped selenium arsenic alloys, to charging with negative electrostatic charges, followed by charging with positive electrostatic charges, in order to substantially neutralize the negative charges residing on the surface of the device, followed by exposing the device to an imagewise pattern of electromagnetic radiation to which the charge carrier generating material is responsive, whereby there is formed an electrostatic latent image on the device, developing said latent image with a toner and optionally transferring said toner to a permanent substrate subsequent to development.

4,330,611

LITHOGRAPHIC PLATE AND PHOTORESIST HAVING PHOTOSENSITIVE LAYERS OF DIAZO AND CINNAMOYLATED POLYVINYL ALCOHOL MATERIALS

Daniel C. Thomas, Wheaton, Ill., and Jack L. Sorkin, University Heights, Ohio, assignors to Richardson Graphics Company, Des Plaines, Ill.

Continuation of Ser. No. 168, Jan. 2, 1979, abandoned, which is a continuation of Ser. No. 870,197, Jan. 17, 1978, Pat. No. 4,133,685, which is a continuation of Ser. No. 755,932, Dec. 30, 1976, abandoned, which is a continuation of Ser. No. 541,455, Jan. 16, 1975, abandoned, which is a continuation-in-part of Ser. No. 435,340, Jan. 21, 1974, abandoned, which is a continuation of Ser. No. 829,149, May 29, 1969, Pat. No. 3,808,004. This application Oct. 20, 1980, Ser. No. 198,363

Int. Cl.³ G03C *1/52, 1/68;* G03F *7/08*

U.S. Cl. 430—156 **1 Claim**

1. A high-speed presensitized plate for lithography or photoresist etching, including in combination a plate base, a sub-base coating over said plate base, a layer of a light sensitive diazo resin condensation product of an aldehyde and a diazonium compound over the sub-base coating and a cinnamate photopolymer coating over said diazo resin layer, wherein the photopolymer coating contains cinnamoylated vinyl chloride-vinyl acetate polymer.

4,330,612

LAMINATE OF MONOLAYER FILM OF CYCLIZED BUTADIENE POLYMER AND OTHER PHOTOSENSITIVE LAYER

Mituru Tashiro, Yokohama; Yoshiyuki Harita, Kawasaki, and Kunihiro Harada, Machida, all of Japan, assignors to Japan Synthetic Rubber Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 109,220, Jan. 3, 1980, abandoned. This application Jul. 16, 1980, Ser. No. 169,464

Claims priority, application Japan, Jan. 23, 1979, 54-5614; Aug. 31, 1979, 54-111597

Int. Cl.³ G03C *1/68*

U.S. Cl. 430—286 **14 Claims**

1. A photosensitive resin film consisting of a laminate of a monolayer film of a composition consisting essentially of (a) 100 parts by weight of a cyclized product of butadiene polymer, (b) 0.1–10 parts by weight of at least one member selected from the group consisting of a photo-crosslinking agent, a photosensitizer and a photo-polymerization initiator and (c) 0.1–5 parts by weight of a storage stabilizer, the cyclized product having a degree of cyclization of 40% to 70%, and an intrinsic viscosity $[\eta]^{30°\,C.}$ toluene of 0.3–0.7 dl/g wherein said cyclized product satisfies the equations (I) $30{,}000 \leqq MW \leqq 300{,}000$, (II) $DC/10 \geqq 9.5 - \log MW$, (III) $DC/5 \leqq 85 + \log MW$, and bonded thereto a composition comprising (d) 100 parts by weight of a polymer of a monoolefinically unsaturated compound, (e) 5 to 100 parts by weight of a polyfunctional, photo-polymerizable, unsaturated compound having at least two photo-polymerizable double bonds, (f) at least one member selected from the group consisting of a photo-crosslinking agent, a photosensitizer and a photo-polymerization initiator, and (g) a storage stabilizer.

4,330,613

PROCESS FOR TONING TACKY IMAGE SURFACES WITH DRY NONELECTROSCOPIC TONERS

Michael G. Fickes, Matawan, N.J., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Nov. 7, 1980, Ser. No. 204,796

Int. Cl.³ G03C *5/04*

U.S. Cl. 430—291 **20 Claims**

1. A process for color development of a surface having imagewise tacky and nontacky areas which comprises

(a) applying to the image-bearing surface dry nonelectroscopic toner comprising pigmented organic resin particles having a size distribution within the range of 0.2 to 30 micrometers and not more than 50 percent of the particles being less than 1 micrometer particle size, the improvement whereby the pigmented particles are surface coated with at least 1% by weight of an antistatic agent in combination with at least 0.5% by weight of slip agent selected from the class consisting of silicone oil having a weight average molecular weight of about 230 to 50,000; saturated hydrocarbons having a weight average molecular weight of about 200 to 10,000; and fluorocarbon compounds having a weight average molecular weight of 500 to 500,000 and

(b) distributing the toner particles over the image surface whereby the distributed toner particles become embedded solely in the tacky image areas, and

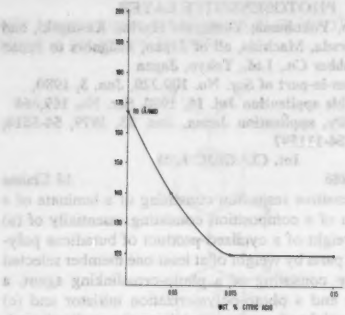
(c) physically removing toner particles from the nontacky areas which are left substantially free of the toner particles.

4,330,614

PROCESS FOR FORMING A PATTERNED RESIST MASK

William A. Moyer, and Robert L. Wood, both of Wappingers Falls, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 14, 1980, Ser. No. 196,944
Int. Cl.³ G03C 5/00
U.S. Cl. 430—325 2 Claims



1. In a process for forming a patterned resist mask, in which a methacrylate polymer layer is formed on a substrate, patternwise exposed to radiation, and then contacted with an organic solvent developer to remove the exposed portions of the layer, the improvement which comprises, adding to said developer an organic complexing agent, wherein a transition metal ion is added in order to provide a tailored development rate.

4,330,615

BLUE BACKGROUND SLIDES FROM A BLACK AND WHITE FILM PROCESS

Alexandra Romanenko, 2180 Jack's Creek Pike, Lexington, Ky. 40515

Filed Mar. 25, 1981, Ser. No. 247,606
Int. Cl.³ G03C 7/00
U.S. Cl. 430—370 1 Claim

1. A blue background process for converting black and white imaged transparent negatives to blue and white imaged transparent negatives comprising

(a) immersing said black and white imaged transparent negative in a blue toner comprising an aqueous solution of oxalic acid, potassium ferricyanide and ferric ammonium citrate;

(b) thereafter immersing in a brown toner comprising an aqueous solution of iodine, potassium iodide and glacial acetic acid;

(c) thereafter immersing in a clear toner comprising an aqueous solution of sodium metabisulfite; and

(d) fixing.

4,330,616

METHOD FOR PROCESSING SILVER HALIDE COLOR PHOTOGRAPHIC MATERIAL

Masayuki Kurematsu, and Shigeharu Koboshi, both of Hino, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Jul. 23, 1981, Ser. No. 286,193
Claims priority, application Japan, Jul. 31, 1980, 55-106004
Int. Cl.³ G03C 7/16, 5/30
U.S. Cl. 430—376 4 Claims

1. A method for processing a silver halide color photographic material which comprises processing said color photographic material in the presence of

(a) an aromatic primary amine color developing agent,

(b) a diphosphonic acid, and

(c) a water soluble metallic salt of magnesium, aluminium, zinc, barium or zirconium in a stoichiometrically equivalent or excess amount with respect to that of diphosphonic acid.

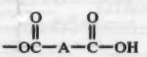
4,330,617

PHOTOGRAPHIC ELEMENTS CONTAINING NOVEL DEVELOPING AGENT PRECURSORS

Minoru Ohashi, and Katsuaki Iwaosa, both of Nagaokakyo, Japan, assignors to Mitsubishi Paper Mills, Ltd., Tokyo, Japan

Filed Feb. 4, 1981, Ser. No. 231,444
Claims priority, application Japan, Feb. 5, 1980, 55/12809
Int. Cl.³ G03C 5/30
U.S. Cl. 430—405 16 Claims

1. In a photographic element suitable for permitting a developing agent precursor to form an —OH group in alkaline solution comprising a support having thereon at least one colloid layer including silver halide emulsion layer, the improvement comprising the incorporation of a hydroquinone or catechol silver halide developing agent precursor having at least one of the hydroxyl groups of hydroquinone or catechol in the form of the following general formula in said silver halide emulsion layer and/or other water permeable colloid layer:



wherein A represents a divalent residue represented by the following general formula (III) or (IV):

(III)

(IV)

wherein n is 2 or 3, R_5 represents a hydrogen atom, a lower alkyl group, a phenyl group, a halogen atom or an alkoxy group, R_6 and R_7 represent a hydrogen atom, a halogen atom, an alkyl group or a phenyl group and R_6 and R_7 taken together may form a benzene ring.

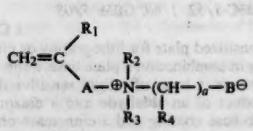
4,330,618

PHOTOGRAPHIC LIGHT SENSITIVE MATERIAL

Junji Minamizono; Shinzo Kishimoto, both of Minami-ashigara, and Takayuki Inayama, Fujinomiya, all of Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Dec. 3, 1980, Ser. No. 212,651
Claims priority, application Japan, Dec. 3, 1979, 54-156473
Int. Cl.³ G03C 5/26, 1/76
U.S. Cl. 430—528 6 Claims

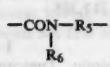
1. A silver-halide photographic light-sensitive multilayered element containing a copolymer within a photographic layer, said copolymer being prepared by copolymerizing a betaine group-containing monomer and a fluorine atom-containing monomer in at least one photographic layer, wherein the total of the betaine group-containing monomer and fluorine atom-containing monomer content is at least 50 mol. %, and wherein said betaine group-containing monomer is represented by formula (I)



(I)

wherein

A can represent an alkylene group containing from 1 to 6 carbon atoms, an arylene group containing from 7 to 11 carbon atoms, an aralkylene group containing from 8 to 12 carbon atoms, a —COOR$_5$—, —CONHR$_5$—, or



group wherein R$_5$ is an alkylene group containing from 1 to 6 carbon atoms, and R$_6$ is an alkyl group containing from 1 to 8 carbon atoms, or A can form, together with

group, a heterocyclic ring or a group containing a heterocyclic ring;

R$_1$ is hydrogen or a lower alkyl group;

R$_2$ and R$_3$ (which may be the same or different) can represent an alkyl group containing 1 to 6 carbon atoms, an aryl group containing from 7 to 11 carbon atoms, or

can form, together with A, a heterocyclic ring or a group containing a heterocyclic ring;

R$_4$ is hydrogen or an alkyl group containing 1 to 6 carbon atoms;

a is a positive integer from 1 tc 6; and

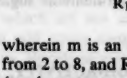
B$^{\ominus}$is a —COO$^{\ominus}$or —SO3$^{\ominus}$;

and further wherein said fluorine atom-containing monomer is represented by the formula (II)

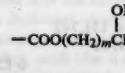
(II)

wherein

R$_7$, R$_8$, R$_9$, R$_{10}$ is each hydrogen, a fluorine atom; a lower alkyl group; —(CF$_2$)$_n$—F, wherein n is an integer from 1 to 8; —O(CF$_2$)$_n$F, wherein n is an integer from 2 to 8; —O(CF$_2$)$_n$H, wherein n is an integer from 2 to 8; —COO(CH$_2$)$_n$H, wherein m is an integer from 1 to 3 and n is an integer from 2 to 8; —COO(CH$_2$)$_m$(CF$_2$)$_n$F, wherein m is an integer from 1 to 3, and n is an integer from 2 to 8;

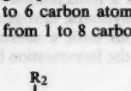


wherein m is an integer from 1 to 3, and n is an integer from 2 to 8, and R$_{11}$ is an alkyl group containing from 1 to 4 carbon atoms; —COO(CH$_2$)$_m$O—(CF$_2$)$_n$F, wherein m is an integer from 1 to 3, and n is an integer from 2 to 8,



wherein m is an integer from 1 to 3, and n is an integer from 2 to 8;

wherein n is an integer from 1 to 4; —O-CO—(CH$_2$)$_m$(CF$_2$)$_n$F, wherein m is zero or an integer from 1 to 3, and n is an integer from 1 to 8; —O-CO(CH$_2$)$_m$(CF$_2$)$_n$H, wherein m is zero or an integer from 1 to 3, and n is an integer from 1 to 8;



wherein R$_{12}$, R$_{13}$ and R$_{14}$ each is a fluorine atom or a fluorine-substituted alkyl group containing 1 to 4 carbon atoms; —CONH(CF$_2$)$_n$F, wherein n is an integer from 2 to 8; or —CONH(CF$_2$)$_n$H, wherein n is an integer from 2 to 8; and at least one of R$_7$, R$_8$, R$_9$ and R$_{10}$ is a group containing a fluorine atom.

4,330,619

ENZYMATIC CONVERSION OF RED CELLS FOR TRANSFUSION

Jack Goldstein, New York, N.Y., assignor to New York Blood Center, Inc., New York, N.Y.

Filed Aug. 14, 1980, Ser. No. 177,972

Int. Cl.^{3} A01N *1/02*; A61K *35/14*

U.S. Cl. 435—2 **12 Claims**

1. A method of converting erythrocytes of the B or A,B antigen type to erythrocytes of the H-antigen type which comprises:

A. equilibrating said erythrocytes to a pH of 5.7–5.8;

B. thereafter contacting the so-equilibrated erythrocytes with α-galactosidase for a period sufficient to convert the B antigen in said erythrocytes to the H-antigen; and

C. thereafter removing said α-galactosidase from said erythrocytes and

D. re-equilibrating said erythrocytes to a pH of 7.2–7.4.

4,330,620

METHOD AND REAGENT FOR THE DETERMINATION OF CREATINE KINASE MB

Wolfgang Gruber, Tutzing-Unterzeismering; Helmut Lenz, Tutzing; Siegfried Looser, Weilheim, and Hans-Ralf Linke, Raisting, all of Fed. Rep. of Germany, assignors to Boehringer Mannheim GmbH, Mannheim-Waldhof, Fed. Rep. of Germany

Filed Feb. 28, 1980, Ser. No. 125,318

Claims priority, application Fed. Rep. of Germany, Mar. 2, 1979, 2908053

Int. Cl.^{3} G01N *33/54*; C12Q *1/50*; C12N *9/99*

U.S. Cl. 435—7 **14 Claims**

1. In a method for the determination of creatine kinase-MB in serum sample of the type comprising immunologically neutralizing the sub-unit M in the sample with an antibody, and then measuring for the enzymatic activity of the sub-unit B of creatine kinase, the improvement comprising neutralizing the sub-unit M with monovalent antibody fragments prepared by proteolytic cleavage under reducing conditions of antibodies which completely inhibit the isoenzyme CK-MM.

8. In a reagent for the determination of creatine kinase MB comprising a reagent system for the enzymatic determination of creatine kinase MB and means for the immunological neutralization of sub-unit M of the creatine kinase MB wherein the improvement comprises using as the means a monovalent antibody fragments prepared by proteolytic cleavage under reducing conditions of antibodies which completely inhibit isoenzyme CK-MM.

4,330,621

ASSAY FOR AMINOGLYCOSIDES

Julian E. Davies, and Stephen Harford, both of Madison, Wis., assignors to Wisconsin Alumni Research Foundation, Madison, Wis.

Filed Aug. 25, 1980, Ser. No. 181,270
Int. Cl.³ C12Q 1/48
U.S. Cl. 435—15 12 Claims

1. A method for assaying a biological fluid sample for an aminoglycoside antibiotic comprising:

(1) treating the biological fluid to render X—SH groups present in said fluid insoluble;

(2) removing the insolubilized X—SH groups;

(3) adjusting the remaining solution to a pH in the range from about 7.5 to about 8.2;

(4) adding acetyl-coenzyme A and a thiol detecting reagent to said pH adjusted solution;

(5) measuring the optical density of the resulting solution spectrophotometrically;

(6) adding an enzyme characterized by a specific activity against aminoglycosides greater than about 50μ moles product formed/min./mg protein;

(7) measuring the optical density of the resulting solution, and

(8) determining the difference in the optical density values obtained in steps (5) and (7) whereby the original concentration of the aminoglycoside in the biological fluid sample can be determined.

4,330,622

ELIMINATION OF NON-MICROBIAL TURBIDITY IN CULTURE MEDIA

Jay S. Desai, Little Ferry, N.J., assignor to Becton Dickinson & Co., Paramus, N.J.

Filed Sep. 12, 1979, Ser. No. 75,158
Int. Cl.³ C12Q 1/04
U.S. Cl. 435—34 27 Claims

1. In a composition containing a culture medium for culturing micro-organisms present in a body fluid and a polyanionic anticoagulant comprising at least one member selected from the group consisting of (1) a sulfated polysaccharide; (2) polyethylene sulfonic acid or salt thereof, (3) polyvinyl sulfuric acid or salt thereof, (4) polystyrene sulfonic acid or salt thereof, (5) sulfate esters of polyoxyethylene ethers of aliphatic alcohols having from 12 to 18 carbon atoms, (6) monothioglycerol, (7) sulfonated naphthalenes and salts thereof, and (8) a salt of polyanethol sulfonate, the improvement comprising:

an absorbant for at least one material selected from the group consisting of lipoproteins and chylomicrons dissolved in the culture medium for sedimenting said material which precipitates from a body fluid during culturing to prevent non-microbial turbidity in the culture medium.

4,330,623

PROCESS FOR SOLUBILIZATION OF GONOCOCCAL ANTIGEN

Yashwant D. Karkhanis, Fanwood, N.J., assignor to Merck & Co., Inc., Rahway, N.J.

Filed Feb. 19, 1980, Ser. No. 122,533
Int. Cl.³ C12P 19/04, 21/00
U.S. Cl. 435—68 4 Claims

1. A process for the solubilization of gonococcal antigens in a physiologically acceptable medium comprising:

(a) suspending the antigen in aqueous sodium hydroxide at pH 7–9;

(b) completely digesting the suspension together with trypsin at 37° C.;

(c) eluting the trypsin digest through an affinity column with water; and

(d) diluting the eluate with a medium.

4,330,624

PROCESS FOR PRODUCING TUNICAMYCIN

Enrique Tejera, Caracas, Venezuela; Sara A. Currie, Roselle, N.J.; James E. Flor, Bridgewater, N.J., and Richard L. Monaghan, Somerset, N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Dec. 3, 1980, Ser. No. 212,385
Int. Cl.³ C12P 19/60
U.S. Cl. 435—75 1 Claim

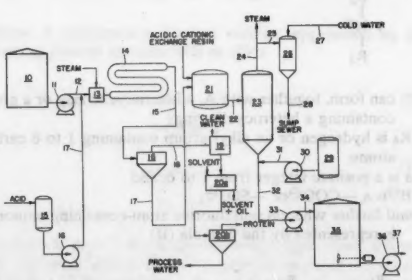
1. A method of producing the antibiotic, Tunicamycin, which comprises cultivating a Tunicamycin-producing strain of *Streptomyces griseus* ATCC 31591 in a fermentation broth containing assimilable sources of carbohydrates, nitrogen and inorganic salts under aerobic conditions until a substantial amount of Tunicamycin is produced in the fermentation broth and recovering the antibiotic.

4,330,625

LIQUEFYING AQUEOUS STARCH SLURRY FOLLOWED BY SACCHARIFICATION WITH ION EXCHANGE RESIN

Franklyn D. Miller, Cincinnati, Ohio, and Werner C. Muller, Dobbs Ferry, N.Y., assignors to National Distillers & Chemical Corp., New York, N.Y.

Continuation-in-part of Ser. No. 129,517, Aug. 28, 1980, Pat. No. 4,266,027. This application Jan. 21, 1981, Ser. No. 226,679
Int. Cl.³ C13K 1/06; C12P 7/06
U.S. Cl. 435—161 17 Claims



1. A process for converting the starch fraction derived from whole dry milled cereal grain to a sterile aqueous solution of fermentable sugar, said starch containing water insoluble protein and oil, which comprises:

(a) liquefying an aqueous slurry of the starch in the presence of an acid hydrolysis catalyst to provide sterile aqueous partial starch hydrolysate slurry containing the water insoluble protein and oil in substantially unaltered condition;

(b) separating the slurry resulting from liquefying step (a) into an aqueous sterile slurry of partial starch hydrolysate and an aqueous slurry of water insoluble protein and oil; and,

(c) saccharifying the relatively thin aqueous slurry of partial starch hydrolysate in the presence of an acidic cationic exchange resin to provide a sterile fermentable sugar.

4,330,626

METHOD OF PREPARING HIGH-ACTIVITY, LOW-BACTERIA, UREASE ENZYME

Henry E. Blair, Barnstable; Stanley E. Charm, Newton, and Richard P. Crowley, Boston, all of Mass., assignors to The Enzyme Center, Inc., Boston, Mass.

Filed Mar. 19, 1980, Ser. No. 131,742
Int. Cl.³ C12N 13/00, 9/80
U.S. Cl. 435—173 6 Claims

1. In a method of preparing the enzyme, urease, from jack beans, wherein the jack beans are reduced to a fine particle size

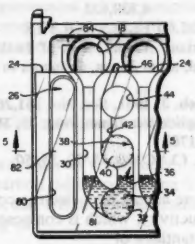
and the fine jack-bean particles thereafter irradiated by gamma irradiation for a period of time, the irradiated jack beans then recovered and employed as a source of urease enzyme, the improvement which comprises:

irradiating the whole jack beans with gamma irradiation prior to size reduction of the jack beans, to provide a urease having lower loss of activity than where the jack beans are first reduced in size and then irradiated.

4,330,627
TESTING TRAY

Michael D. Thomas, and Francis E. Ryder, both of Arab, Ala., assignors to Ryder International Corporation, Arab, Ala.

Filed Feb. 9, 1979, Ser. No. 10,954
Int. Cl.³ C12M *1/20*
U.S. Cl. 435—301 **6 Claims**



1. A testing tray comprised of a plurality of testing channels for the conducting of a plurality of identification tests, or the like, in conjunction with a liquid specimen, said tray being capable of use with the testing channels in a generally vertical orientation comprising: a base having a plurality of separate testing channels formed therein, each said channel being of a reverse bend configuration and including at a first end thereof an entry portion for the introduction of a liquid specimen, and a vent segment at the opposite end, with a testing portion intermediate said channel ends, transparent sheet means affixed to and overlying said base to cover the testing portion of each said channel and effective to isolate each testing channel from the other while leaving the entry portion and the vent segment of each testing channel substantially open, a cover member pivotally mounted to said base adjacent said entry portion and the vent segment of the respective channels, said cover member being movable between a first, open position, wherein access to said entry portion is provided and said vent segment is open, and a second, closed position, wherein said cover overlies both said entry portion and said vent segment said cover member including a section of porous absorbent material engaged against said base and overlying those portions of the entry portions and the vent segments of the respective channels which are not covered by the transparent sheet means when said cover member is in the closed position, with said porous, absorbent material adapted to absorb any excess liquid specimen at either the entry portion or the vent segment of the testing channels, and due to the porous nature of said material, enabling said vent segment ot function even though the cover member is in the second, closed position, and said base including a desiccant chamber formed therein, with channel means interconnecting each said testing channel with said desiccant chamber, such that a dessicant element may be placed therein to extract undesired moisture from each said testing channels prior to use of the tray.

4,330,628
ALKALI-RESISTANT GLASS FIBRES

David R. Cockram, and Kenneth M. Fyles, both of Wigan, England, assignors to Pilkington Brothers Limited, Mereyside, England

Filed Mar. 17, 1980, Ser. No. 130,688
Claims priority, application United Kingdom, Mar. 15, 1979, 7909189
Int. Cl.³ C03C *13/00, 3/04;* C04B *7/02*
U.S. Cl. 501—38 **13 Claims**

1. Alkali-resistant glass fibres formed from a glass composition consisting essentially of, in weight percentages:

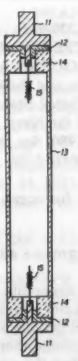
SiO_2	50 to 75%
$ThO_2 + ZrO_2$	5 to 30% with ThO_2 being in the range of at least 0.4% up to 4%
R_2O	0 to 25%
R'O	0 to 40%
R_2O + R'O	10 to 40%
Rare earth oxides	0 to 20%
TiO_2	0 to 10%

the content of ThO_2 being at least 1% when the content of ZrO_2 is less than 6%, where R_2O represents Na_2O, K_2O or Li_2O, with K_2O not exceeding 10% and Li_2O not exceeding 5% and R'O represents one or more of MgO, CaO, SrO, BaO, ZnO and MnO.

4,330,629
HEAT-RESISTANT SEALING MATERIALS

Peter Hing, and Ehsan U. Khan, both of London, England, assignors to Thorn EMI Limited, London, England

PCT No. PCT/GB78/00026, § 371 Date Jun. 7, 1979, § 102(e) Date Jun. 7, 1979, PCT Pub. No. WO79/00220, PCT Pub. Date May 3, 1979
PCT Filed Oct. 18, 1978, Ser. No. 46,550
Int. Cl.³ C03C *3/12, 3/14*
U.S. Cl. 501—47 **7 Claims**



1. A sealing composition for use in electrical discharge devices consisting of by weight from 55 to 95% of a rare earth oxide, from 5 to 45% of boric oxide, an amount of up to 5% of phosphorous pentoxide and an amount of up to 5% of an oxide selected from aluminum oxide and magnesium oxide.

4,330,630

FUSED CAST REFRACTORY COMPOSITIONS AND GLASS MELTING FURNACES INCORPORATING THEM

Pierre L. Jeanvoine, Morieres les Avignon, and Maurice Gardiol, Avignon, both of France, assignors to Societe Europeenne des Produits Refractaires, Neuilly-sur-Seine, France

Filed Feb. 27, 1981, Ser. No. 238,975

Claims priority, application France, Mar. 14, 1980, 80 05777

Int. Cl.³ C04B 35/48

U.S. Cl. 501—105 5 Claims

1. In a fused cast refractory composition which comprises, by weight and on an oxide basis:

1 to 74% of Cr_2O_3,

15 to 40% of ZrO_2,

3 to 76% of Al_2O_3,

7.5 to 20% of SiO_2, and

a small amount of at least one alkali metal oxide,

the improvement wherein said composition includes 0.3 to 4.0% of at least one additional oxide selected from the group consisting of iron oxide and manganese oxide, and wherein the sum of the specified ingredients is at least 97% of the total composition.

4,330,631

DIELECTRIC CERAMICS

Syunichiro Kawashima, Nishinomiya; Masamitsu Nishida; Ichiro Ueda, both of Osaka, and Hiromu Ouchi, Toyonaka, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Jun. 24, 1981, Ser. No. 277,003

Claims priority, application Japan, Jul. 1, 1980, 55-90260

Int. Cl.³ C04B 35/46, 35/50

U.S. Cl. 501—139 1 Claim

1. A dielectric ceramic composition consisting of barium oxide, titanium oxide and samarium oxide characterized in that, when its composition formula is represented by $xBaO—yTiO_2—zSm_2O_3$, its ingredient composition represented in terms of percentage by mole falls in the following range:

$$5 \leqq x \leqq 23,$$

$$57 \leqq y \leqq 82.5$$

and

$$2.5 \leqq z \leqq 37.5,$$

provided that $x+y+z=100$.

4,330,632

LIGHTWEIGHT CONCRETE USING POLYMER FILLED AGGREGATE FOR OCEAN APPLICATIONS

Harvey H. Haynes, Camarillo, and Robert D. Rail, Ojai, both of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Dec. 24, 1980, Ser. No. 219,689

Int. Cl.³ C04B 7/02, 33/04

U.S. Cl. 501—140 14 Claims

1. A lightweight concrete for ocean structures and applications, comprising:

a. a binder material;

b. a specially prepared aggregate admixed with said binder material;

c. said specially prepared aggregate comprising:

a lightweight aggregate the individual particles of which have a porous internal cellular structure providing a 30 to 60 percent void volume therein; said individual aggregate particles having the void volume of their porous internal cellular structure substantially filled with a solid material; said void volume of the lightweight aggregate porous internal cellular structure being filled under pressure with a polymer material which is cured to a solid hardened state to provide strength to the individual aggregate particles prior to admixing with the binder material; said aggregate filled with polymer material having approximately the same unit weight as seawater saturated regular lightweight aggregate; said polymer material filling only the void volume of the aggregate porous internal cellular structure and not voids in the lightweight concrete binder material;

d. said polymer material which fills the voids in said lightweight aggregate particles being formed from a liquid monomer comprising, by weight, 83 percent methyl methacrylate, 5 percent trimethylolpropane trimethacrylate, and 12 percent polymethyl methacrylate, impregnated into said voids, and polymerized by heat into a solid;

e. said specially prepared aggregate having greater strength and minimizing the absorption of seawater by the aggregate and imparting higher compressive strengths to the resultant lightweight concrete over regular lightweight concretes of equal unit weight while maintaining a desirable relatively low elastic modulus;

f. said lightweight concrete using polymer filled aggregate being operable in use to substantially function as a waterproof barrier.

4,330,633

SOLID ELECTROLYTE

Eishin Yoshisato; Shizuo Azuma, both of Iwakuni, and Teizo Yamaji, Yamaguchi, all of Japan, assignors to Teijin Limited, Osaka, Japan

Filed Feb. 3, 1981, Ser. No. 231,269

Claims priority, application Japan, Aug. 15, 1980, 55-111787; Aug. 15, 1980, 55-111788

Int. Cl.³ C04B 35/00, 35/50

U.S. Cl. 501—152 10 Claims

1. A solid electrolyte having high electron conductivity and high oxide ion conductivity, which is composed of a sintered body consisting substantially of

(a) 5 to 85 mole% of an oxide of cobalt,

(b) 2 to 70 mole% of an oxide of at least one metal selected from strontium and lanthanum, and

(c) 13 to 80 mole% of an oxide of at least one metal selected from bismuth and cerium.

4,330,634

FOAM COMPOSITES

Bruce K. Rodaway, Birmingham, England, assignor to Dunlop Limited, London, England

Filed Nov. 24, 1980, Ser. No. 209,679

Claims priority, application United Kingdom, Dec. 7, 1979, 7942389

Int. Cl.³ C08J 9/30

U.S. Cl. 521—65 14 Claims

1. A composite comprising hollow silica spheres having a silica content from 40 to 70% by weight and a size range of 0.03 to 0.0005 CM. in an organic polyacid foam matrix containing poly(vinyl alcohol), wherein said organic polyacid is a polymer of an organic carboxylic acid.

4,330,635

FOAMABLE POLYMERIC COMPOSITION

Edward F. Tokas, Kirkwood, Mo., assignor to Monsanto Company, St. Louis, Mo.

Division of Ser. No. 137,161, Apr. 4, 1980, abandoned. This application Dec. 15, 1980, Ser. No. 216,572

Int. Cl.³ C08J 9/00

U.S. Cl. 521—79 7 Claims

1. A method for foaming a polymeric composition of:

A. a copolymer of alkenyl aromatic and alkenyl nitrile monomers,

B. optionally, a diene rubber grafted with said monomers, and

C. a foaming agent selected from the polyacid group consisting of citric, succinic, tartaric, glutaric, malic, malonic or

salts and mixtures thereof in their anhydrous form as the sole blowing agent comprising the steps: blending (A), (C) and optionally (B) by melt colloiding at temperatures of about 15° to 325° C., under super-atmospheric pressure, passing said colloided melt into a zone of lower pressure, allowing said polymeric composition to foam to a density of 2 to 60 lbs. per cu.in., as a closed cell foamed composition having dimensional stability when cooled.

4,330,636

CARBAMYLBIURET-MODIFIED POLYISOCYANATES

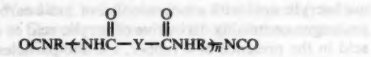
Donald L. Christman, Grosse Ile, and Peter T. Kan, Plymouth, both of Mich., assignors to BASF Wyandotte Corporation, Wyandott, Mich.

Continuation-in-part of Ser. No. 92,479, Nov. 8, 1979, Pat. No. 4,271,087. This application Dec. 29, 1980, Ser. No. 220,555

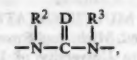
Int. Cl.³ C08G *18/14*

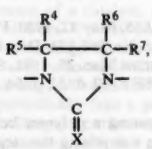
U.S. Cl. 521—155 **7 Claims**

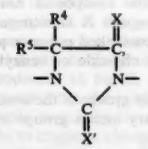
1. In the process for the preparation of a polyurethane foam by a method which comprises reacting an organic polyisocyanate with an organic compound containing at least two hydrogen-containing groups as determined by the Zerewitinoff method, the improvement which comprises employing as an organic polyisocyanate compound the carbamylbiuret-modified polyisocyanate of the formula

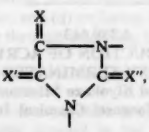


wherein n is an integer of from about 1 to about 20; R is a divalent hydrocarbon radical containing from about 1 to about 18 carbon atoms; and Y is the divalent radical selected from the group consisting of


(a)

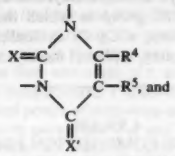

(b)

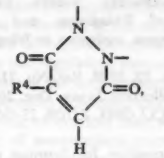

(c)


(d)

(e)

-continued


(f)


(g)

wherein D is selected from the group consisting of O, S, and NH; X, X', and X'' are independently selected from the group consisting of oxygen and sulfur; R^2 and R^3 are independently selected from the group consisting of aryl of from about 6 to about 18 carbon atoms, alkyl containing from about 1 to about 6 carbon atoms, and cycloalkyl containing from about 3 to about 7 carbon atoms, provided that each of R^2 and R^3 differs from R; R^4, R^5, R^6, and R^7 are independently selected from the group consisting of hydrogen, alkyl containing from about 1 to about 6 carbon atoms, cycloalkyl containing from about 3 to about 7 carbon atoms, phenyl, and benzyl.

4,330,637

ENCAPSULATED ELECTRONIC DEVICES AND ENCAPSULATING COMPOSITIONS

Ching-Ping Wong, Lawrence Township, Mercer County, N.J., assignor to Western Electric Company, Inc., New York, N.Y.

Filed Jan. 5, 1981, Ser. No. 222,443

Int. Cl.³ C08K *5/34*

U.S. Cl. 524—720 **29 Claims**

1. A method of sequestering HCl and chelating anions on an electronic device which comprises applying to the device an encapsulant containing therein a metallo-porphyrin compound.

4,330,638

RADICAL POLYMERIZATION IN THE PRESENCE OF SUBSTITUTED TARTARIC ACID OR TARTARIC ACID DERIVATIVES AS INITIATORS

Heinrich Wolfers, Rheurdt; Wolfram Mayer; Hans Rudolph, both of Krefeld, and Fritz Mietzsch, Cologne, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

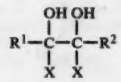
Continuation of Ser. No. 100,201, Dec. 4, 1979, abandoned. This application Feb. 24, 1981, Ser. No. 237,744

Claims priority, application Fed. Rep. of Germany, Dec. 14, 1978, 2853938

Int. Cl.³ C08F *4/32*; C08G *63/76*

U.S. Cl. 525—12 **2 Claims**

2. A composition comprising a radically polymerizable monounsaturated compound, a polyunsaturated compound or a mixture thereof and 0.05 to 2% by weight, based on the unsaturated compound of a polymerization initiator of the formula



wherein R^1 and R^2 are the same or different and are selected from the group consisting of optionally substituted C_1–C_{10} alkyl, C_5–C_7 cycloalkyl, C_7–C_{10} aralkyl and C_6–C_{10} aryl and X is a nitrile or —COOR group in which the R moiety is a C_1–C_{18} aliphatic moiety, a C_5–C_7 cycloaliphatic moiety, a C_7–C_{10} araliphatic moiety, a phenyl moiety or a silyl moiety.

4,330,639

POLYMER BLEND COMPOSITION FOR FORMING POLYETHYLENE FILM

Kazuo Matsuura, Kawasaki; Noboru Yamaoka; Shinichi Yanahashi, both of Yokohama, and Mituji Miyoshi, Kanagawa, all of Japan, assignors to Nippon Oil Company, Ltd., Tokyo, Japan

Filed Dec. 22, 1980, Ser. No. 218,620

Claims priority, application Japan, Dec. 26, 1979, 54-168177

Int. Cl.³ C08L *23/08, 23/06*

U.S. Cl. 525—240 4 Claims

1. A polymer composition for forming polyethylene film comprising an ethylene/C_3–$C_8\alpha$-olefin copolymer, said copolymer having been prepared by copolymerizing ethylene and a C_3–$C_8\alpha$-olefin in a substantially solvent free vapor phase condition and in the presence of a catalyst which is an organoaluminum compound and a solid substance, said solid substance being a magnesium containing inorganic solid carrier and at least one member selected from the group consisting of a titanium compound and a vanadium compound; said copolymer being further characterized as having an intrinsic viscosity of 1.3 to 8.7 dl/g determined in decalin at 135° C. and a density of 0.850 to 0.904; said copolymer being mixed with an ethylene polymer having a melt index of 0.01 to 0.2, a flow parameter of 1.9 to 2.8 and a density of at least 0.940, the weight percent ratio of said copolymer to said polymer being from 0.1 to 40:99.9 to 60.

4,330,640

NOVEL ACRYLIC POLYMERS AND THE MICHAEL ADDUCTS THEREOF USEFUL IN COATING APPLICATIONS

Stephen L. Buchwalter, Allison Park, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

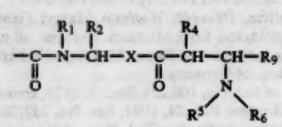
Filed Jun. 16, 1980, Ser. No. 159,578

Int. Cl.³ C08F *271/00*

U.S. Cl. 524—555 13 Claims

1. A resinous composition comprising:

(a) a polymer characterized by at least one pendant group of the formula



wherein R_1, R_2, R_4, and R_9, each independently, is a hydrogen or an alkyl group containing from about 1 to about 6 carbon atoms; wherein X represents a moiety —O—R_{10}—O— of which R_{10} is an alkylene group containing from about 1 to 6 carbon atoms; and wherein the radical

is derived from ammonia, a primary amine or secondary amine.

4,330,641

IMPACT-RESISTANT THERMOPLASTIC MOLDING MATERIALS WITH IMPROVED STRESS-CRACKING RESISTANCE

Adolf Echte, Ludwigshafen; Hermann Gausepohl, Mutterstadt; Helmut Jenne, Schriesheim, and Hans Mittnacht, Weinheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Nov. 6, 1980, Ser. No. 204,527

Claims priority, application Fed. Rep. of Germany, Nov. 20, 1979, 2946761; Dec. 19, 1979, 2951117

Int. Cl.³ C08F *279/02, 279/04, 279/06*

U.S. Cl. 525—310 3 Claims

1. A thermoplastic molding material which contains a polymer of a monovinyl-aromatic compound which is formed by polymerizing the said compound in the presence of a rubber and which has hence been made impact-resistant with said rubber, said polymer including dispersed heterogeneous soft component, the proportion of soft component dispersed in the impact-resistant polymer being between 28–50% by weight, and the tensile strength of the molding material, measured by a tensile test on a molded dumbbell-shaped bar, according to DIN No. 53,455, being not less than 5% above the corresponding yield strength, wherein the polymer is formed by copolymerizing a monovinyl-aromatic compound with from 2 to 12% by weight of an acrylic acid derivative or methacrylic acid derivative, said derivative being an ester of acrylic acid or methacrylic acid with a monoalcohol of 1 to 8 carbon atoms or a nitrogen containing derivative of acrylic acid or methacrylic acid in the presence of a rubber, and the particles of the disperse soft component phase in the impact-resistant polymer have a weight-average mean diameter of not less than 3.5 μm, the swelling index of the soft component in toluene is from 8 to 15.

4,330,642

POLYMER BOUND MULTIDENTATE COMPLEXES

John H. Gaul, Jr., Midland, Mich., and Russell S. Drago, Champaign, Ill., assignors to University of Illinois Foundation, Urbana, Ill.

Division of Ser. No. 148,065, May 12, 1980, Pat. No. 4,281,086, which is a division of Ser. No. 968,123, Dec. 11, 1978, Pat. No. 4,230,828. This application Mar. 20, 1981, Ser. No. 245,578

Int. Cl.³ C08F *8/30, 8/32, 8/04, 8/28*

U.S. Cl. 525—337 8 Claims

1. A process for preparing a polymer bound multidentate polyamine ligand system comprising the steps of

(a) condensing a nitrile compound having the formula $HX(CH_2CH_2CN)_2$ where X is nitrogen or phosphorus with an insoluble crosslinked polymer possessing at least one pendant benzyl chloride or benzyl iodide function; and

(b) converting the nitrile groups of the condensation product of step (a) to primary amino groups by reduction with BH_3.

4,330,643

PROCESS FOR PRODUCTION OF ACRYLOYLOXY- OR METHACRYLOYLOXY-TERMINATED POLYESTERS

Takahisa Ogasawara, and Kiyokazu Mizutani, both of Nagoya, Japan, assignors to Toagosei Chemical Industry Co., Ltd., Tokyo, Japan

Filed Feb. 23, 1981, Ser. No. 237,054

Claims priority, application Japan, Feb. 22, 1980, 55-20401

Int. Cl.³ C08G *63/18*

U.S. Cl. 525—445 6 Claims

1. A process for producing an acryloyloxy- or methacryloyloxy-terminated polyester which comprises reacting a hydroxy-terminated polyester with acrylic acid or methacrylic acid, said hydroxy-terminated polyester comprising (a) a dicarboxylic acid unit comprising about 10 to about 80 mol% of a terephthalic acid unit and about 90 to about 20 mol% of an-

other dicarboxylic acid unit and (b) a dihydric alcohol unit containing about 30 mol% or more of a dihydric alcohol unit containing 3 or more carbon atoms, and having a number average molecular weight of about 400 to about 5,000.

4,330,644

CURABLE TRIS(HYDROXYALKYL) AMINOMETHANE-MODIFIED EPOXY RESIN COMPOSITION

Roy A. Allen, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Apr. 3, 1981, Ser. No. 250,980
Int. Cl.³ C08G *59/28, 59/64*
U.S. Cl. 525—523 9 Claims

1. A curable composition comprising (1) a solid epoxy composition prepared by reacting (a) a solid epoxy resin prepared by reacting a normally liquid epoxy resin containing at least one vicinal epoxy group in the molecule with a polyhydric phenol in the presence of an etherification catalyst with (b) from about 0.01% to about 1.0% by weight based on the solid epoxy resin of a tris(hydroxyalkyl)aminomethane and (2) at least one epoxy curing agent.

4,330,645

PREPARATION OF PROPYLENE HOMOPOLYMERS OR COPOLYMERS

Dirk Juza, Wesseling, and Dieter Stein, Limburgerhof, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Mar. 31, 1981, Ser. No. 249,691
Claims priority, application Fed. Rep. of Germany, Apr. 19, 1980, 3015089
Int. Cl.³ C08F *2/34, 10/06*
U.S. Cl. 526—61 1 Claim

1. A process for the preparation of propylene homopolymers, or of propylene copolymers which contain more than 50 percent by weight of propylene and less than 50 percent by weight of other α-monoolefins of 2 to 6 carbon atoms, as copolymerized units, by polymerizing the corresponding monomer(s) by means of a catalyst, at from 40° to 150° C., under a pressure of from 10 to 50 bar, in the gas phase, in a centric stirred bed, having radius r and height h, of finely divided polymer, with removal of the heat of polymerization by evaporative cooling, wherein the monomer is introduced continuously or periodically into a polymerization zone and the polymer is discharged continuously or periodically from the polymerization zone, with the provisos that (a) in the polymerization zone the pressure and temperature are kept in a range which corresponds to the gaseous state of the monomer, (b) gaseous monomer not consumed by the polymerization is discharged from the polymerization zone, liquefied, stored and reintroduced, as liquid, into the polymerization zone, (c) the temperature in the polymerization zone is regulated by continuously measuring the temperature and causing any change therein to trigger a change in the amount of liquid monomer, evaporating in the reaction zone, which is introduced per unit time, and (d) replacing the monomer consumed by polymerization through supplying fresh monomer, in which process

(1) in the centric stirred bed, the relation r:h=1:1 to 1:3 applies,

(2) the finely divided polymer in the centric stirred bed is caused to move upward in the peripheral zone of the stirred bed and downward in the central zone of the stirred bed, in such a way as to give a Froude number of from 0.4 to 5,

(3) the temperature in the polymerization zone is regulated by simultaneously measuring the temperature

(3.1) at one or more points of the geometrically cylindrical inner part of the stirred bed which is defined by the relation $h.\pi.a^2$, where a is the innermost one-tenth of the radius r of the centric stirred bed, and

(3.2) at one or more points of the outer part of the stirred bed, geometrically in the shape of a symmetrical hollow cylinder, defined by the relation $h.\pi.r^2$-$h.\pi.a^2$, with the provisos that the total number of measurement points is not greater than ten and that the radial distance between a measurement point in the inner part (3.1) and a measurement point in the outer part (3.2) of the stirred bed is not less than one-tenth of r, and

(4) the actual temperatures T determined simultaneously at the individual points of measurement are combined to give a temperature parameter T_M and the difference of this parameter from the intended value triggers the regulating operation, or the temperature differences ΔT between the actual and intended temperatures, measured simultaneously at the individual points of measurement, are combined to give a difference parameter ΔT_M and this parameter triggers the regulating operation, with the proviso that in combining the actual temperatures T or the temperature differences ΔT, each individual measured value has a weighting of not less than 40/n%, where n is the total number of measurement points, in the temperature parameter T_M or the difference parameter ΔT_M.

4,330,646

POLYMERIZATION OF AN α-OLEFIN

Hisaya Sakurai; Yoshihiko Katayama; Tadashi Ikegami, and Masayasu Furusato, all of Kurashiki, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Jul. 21, 1980, Ser. No. 170,385
Claims priority, application Japan, Aug. 13, 1979, 54-102187; Aug. 16, 1979, 54-103556; Aug. 25, 1979, 54-108507
Int. Cl.³ C08F *4/02, 10/00*
U.S. Cl. 526—116 32 Claims

1. A process for polymerizing an α-olefin comprising contacting the olefin in liquid phase at a temperature of about 120° to about 320° C. with a catalyst comprising a component (A) and an organometal component (B), the component (A) being produced by reacting a hydrocarbon-soluble organomagnesium component (i) of the formula

$$M_\alpha Mg_\beta R_p^1 R_q^2 X_r^1 X_s^2$$

wherein

α, p, q, r and s each independently is 0 or a number greater than 0,

β is 1 or a number greater than 1,

$p+q+r+s=m\alpha+2\beta$

$0 \leqq (r+s)/(\alpha+\beta) < 2$,

m is the valence of M,

M is a metal of the 1st to 3rd groups of the Periodic Table,

R^1 and R^2 each independently is a hydrocarbon group having 1 to 20 carbon atoms,

X^1 and X^2 each independently is hydrogen or an organic electronegative group containing O, N or S,

with (ii) a halide of boron, silicon, germanium, tin, phosphorus, antimony, bismuth or zinc, and contacting the product of (i)+(ii) in an inert reaction medium with (iii) a compound of tetravalent titanium or (iii) a compound of tetravalent titanium plus a compound of pentavalent or tetravalent vanadium at a concentration of titanium plus vanadium of at most about 2 mols per liter of the inert reaction solvent, the atomic ratio of Mg/Ti or (Ti+V) in (A) being about 3 to about 500.

4,330,647

PROCESS FOR POLYMERIZING α-OLEFINS

Hisaya Sakurai; Yoshihiko Katayama; Tadashi Ikegami, and Masayasu Furusato, all of Kurashiki, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Aug. 13, 1980, Ser. No. 177,547
Claims priority, application Japan, Sep. 28, 1979, 54-124912; Jul. 4, 1980, 55-090720
Int. Cl.³ C08F *4/02, 10/00*
U.S. Cl. 526—116 41 Claims

1. A process for polymerizing an α-olefin comprising con-

tacting the olefin in liquid phase at a temperature of about 120° to 320° C. with a catalyst comprising a component (A) and an organometal component (B), the compenent (A) being produced by reacting a hydrocarbon-soluble organomagnesium component (i) of the formula,

$$M_\alpha MgR_p{}^1R_q{}^2X_r{}^1X_s{}^2D_t$$

wherein

α, p, q, r, s and t each independently is 0 or a number greater than 0,

$[0<(r+s)/(\alpha+1)<2,\ ]0<(r+s)/(\alpha+1)<1.5$,

m is the valence of M,

M is a metal of the 1st to 3rd groups of the Periodic Table,

R^1 is a hydrocarbon group having 1 to 20 carbon atoms,

R^2 is a secondary or tertiary alkyl group having 3 to 20 carbon atoms,

X^1 and X^2 each independently is a hydrogen atom or an organic electronegative group containing O, N or S,

D is an electron donor,

with a compound (ii) of the formula,

$$R_a{}^3CY_{4-a}$$

wherein

R^3 is a hydrogen atom or a hydrocarbon group having 1 to 10 carbon atoms,

Y is a halogen atom,

a is 0 or 1,

and contacting the product of (i)+(ii) with (iii) a compound of tetravalent titanium and/or a compound of pentavalent or tetravalent vanadium at a concentration of titanium plus vanadium of at most about 2 mols per liter of an inert reaction solvent, the atomic ratio of Mg/(Ti+V) in (A) being about 3 to about 500.

4,330,648

CATALYST AND PROCESS OF POLYMERIZATION OF ALPHA-MONOOLEFINS

M. Bruce Welch, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Dec. 13, 1977, Ser. No. 860,262

Int. Cl.³ C08F *4/02, 10/00*

U.S. Cl. 526—125 **28 Claims**

1. A process for the polymerization of at least one alpha-monoolefin monomer which comprises polymerizing said at least one alpha-monoolefin monomer under polymerization conditions employing the catalyst system consisting essentially of (A) a milled admixture of effective ratios of a titanium halide, anhydrous magnesium or manganous chloride, optionally, with a Lewis base, and (B) effective ratios of at least one dihydrocarbylaluminum halide, at least one dihydrocarbylaluminum hydride, and an ether-alcohol, employing catalytically effective ratios of said (A):(B).

4,330,649

PROCESS FOR PRODUCING OLEFIN POLYMERS OR COPOLYMERS

Mamoru Kioka, Ohtake; Hiroaki Kitani, Waki, and Norio Kashiwa, Iwakuni, all of Japan, assignors to Mitsui Petrochemical Industries, Ltd., Tokyo, Japan

Filed Jun. 13, 1980, Ser. No. 159,440

Claims priority, application Japan, Jun. 18, 1979, 54-75582

Int. Cl.³ C08F *4/02, 10/00*

U.S. Cl. 526—125 **6 Claims**

1. In a process for producing a polymer or copolymer of an olefin which comprises polymerizing or copolymerizing the olefin or olefins with or without up to about 5 miles of a diolefin in the presence of a catalyst composed of

(A) a solid titanium catalyst component containing magnesium, titanium, halogen and an electron donor and derived from a magnesium compound in the liquid state, a halogen-containing titanium compound in the liquid state and the electron donor, and

(B) an organometallic compound of a metal selected from the group consisting of metals of Groups I to III of the periodic table; the improvement wherein

(I) said catalyst component (A) is (i) the product of reaction of (a) a magnesium compound in the liquid state having no reducing ability with (b) a halogen-containing titanium compound in the liquid state in the presence of an electron donor having no active hydrogen, said magnesium compound (a) being a liquid magnesium compound or a solution of a magnesium compound in a hydrocarbon solvent or being obtained by contacting the magnesium compound with at least one electron donor selected from the group consisting of alcohols, organic carboxylic acids, aldehydes, amines and mixtures thereof, or (ii) the product of reaction of the magnesium compound (a) with the halogen-containing titanium compound (b) in the absence of the electron donor having no active hydrogen atom followed by treatment with the electron donor having no active hydrogen atom, the halogen-containing titanium compound (b) being present in such an amount that the solid titanium catalyst component (A) is formed and precipitated and is at least 1 mole per mole of the magnesium compound (a), and

(II) the mole ratio of the compound (a) to the compound (b), in the catalyst component (A), calculated as metal atoms, is at least about 4.

4,330,650

CATALYST FOR POLYMERIZATION OF OLEFINS

Hisaya Sakurai; Hideo Morita; Masayoshi Miya; Katsuhiko Takaya, and Haruyuki Yoneda, all of Kurashiki, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Division of Ser. No. 19,674, Mar. 12, 1979. This application Mar. 28, 1980, Ser. No. 135,069

Claims priority, application Japan, Mar. 15, 1978, 53-28574

Int. Cl.³ C08F *4/02, 10/00*

U.S. Cl. 526—127 **12 Claims**

1. In a process for the polymerization of olefins comprising contacting the olefins with a catalyst comprising a magnesium compound, a titanium compound, an electron donor, and an organometallic compound, wherein a solid (1) obtained by reacting one mole of (i) an organomagnesium component of the formula

$$M_\alpha Mg_\beta R^1{}_pR^2{}_qX_r$$

wherein

α, p, q and r each independently $\geqq 0$,

$\beta > 0$,

$p+q+r=m\alpha+2\beta$

M is Al, Zn, B or Be,

m is the valence of M,

R^1 and R^2 are the same or different hydrocarbon groups having 1–20 carbon atoms, and

X is a halogen atom,

or of the reaction product of $M_\alpha Mg_\beta R^1{}_pR^2{}_qX_r$ with an electron donor,

with 0.01 to 100 moles of (ii) a chlorosilane compound containing Si—H bonds and of the formula

$$H_aSiCl_bR^3{}_{4-(a+b)}$$

wherein

$0<a\leqq 2$,

$b>0$,

$a+b\leqq 4$, and

R^3 is a hydrocarbon group having 1–20 carbon atoms,

is used as a catalyst raw material, a solid catalyst component (A) is obtained by reacting and/or grinding said solid (1), a titanium compound (2) selected from a tetravalent titanium

compound containing at least one halogen atom and/or a halide of trivalent titanium, and a carboxylic acid ester (3) and said catalyst component (A) is used with a component (B) which includes an organometallic compound and a carboxylic acid ester (3), the improvement wherein said last-mentioned carboxylic acid ester (3) of component (B) is a nitrogen-, sulfur- and/or oxygen-containing heterocyclic carboxylic acid ester selected from the group consisting of pyrrol-carboxylic acid esters, indole-carboxylic acid esters, carbazole-carboxylic acid esters, oxazole-carboxylic acid esters, thiazole-carboxylic acid esters, imidazole-carboxylic acid esters, pyrazole-carboxylic acid esters, pyridine-carboxylic acid esters, phenanthridinecarboxylic acid esters, anthrazoline-carboxylic acid esters, phenanthroline-carboxylic acid esters, naphthylidine-carboxylic acid esters, oxadine-carboxylic acid esters, thiazine-carboxylic acid esters, pyridazine-carboxylic acid esters, pyrimidine-carboxylic acid esters, pyrazine-carboxylic acid esters, thianaphthene carboxylic acid esters, isothianaphthene carboxylic acid esters, benzothiophene carboxylic acid esters, phenoxathiin carboxylic acid esters, benzothiane carboxylic acid esters, thiaxanthene carboxylic acid esters, thioindoxyl carboxylic acid esters, furan carboxylic acid esters, dihydrofuran carboxylic acid esters, benzofuran carboxylic acid esters, coumaran carboxylic acid esters, pyran carboxylic acid esters, pyrone carboxylic acid esters, coumalic acid esters, and isocoumalic acid esters.

4,330,651

POLYMERIZATION OF α-OLEFINS

Hisaya Sakurai; Yoshihiko Katayama; Tadashi Ikegami, and Masayasu Furusato, all of Kurashiki, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Aug. 13, 1980, Ser. No. 177,545

Claims priority, application Japan, Sep. 28, 1979, 54-124912; Oct. 19, 1979, 54-134931

Int. Cl.³ C08F *4/02, 10/00*

U.S. Cl. 526—127 **45 Claims**

1. A process for polymerizing an α-olefin comprising contacting the olefin in liquid phase at a temperature of about 120° to 320° C. with a catalyst comprising a component (A) and an organometal component (B), the component (A) being produced by reacting a hydrocarbon-soluble organomagnesium component (i) of the formula,

$$M_\alpha MgR_p{}^1R_q{}^2X_r{}^1X_t{}^2D_f$$

wherein

α, p, q, r, s and t each independently is 0 or a number greater than 0,

$p+q+r+s=m\alpha+2$,

$0 \leqq (r+s)/(\alpha+1) < 2$,

m is the valence of M,

M is a metal of the 1st to 3rd groups of the Periodic Table,

R^1 and R^2 each independently is a hydrocarbon group having 1 to 20 carbon atoms,

X^1 and X^2 each independently is a hydrogen atom or an organic electronegative group containing O, N or S,

D is an electron donor, with an aluminum compound (ii) of the formula,

$$AlX_x{}^3Y_y$$

wherein

X^3 is OR^3, $OSiR^4R^5R^6$, NR^7R^8 or SR^9 wherein R^3 and R^9 each independently is a hydrocarbon group having 1 to 20 carbon atoms and R^4, R^5, R^6, R^7 and R^8 each independently is a hydrogen atom or a hydrocarbon group having 1 to 20 carbon atoms,

Y is a halogen atom,

x and y each independently is a number greater than 0 and less than 3,

$x+y=3$,

and contacting the product of (i)+(ii) with (iii) a compound of tetravalent titanium and/or a compound of vanadium at a concentration of titanium plus pentavalent or tetravalent vanadium of at most about 2 mols per liter of an inert reaction solvent, the atomic ratio of Mg/(Ti+V) in (A) being about 3 to about 500.

4,330,652

PROCESS FOR POLYMERIZING PROPYLENE WITH AN IMPROVED TITANIUM CHLORIDE CATALYST

Ronald E. Gilbert, and Rajindar K. Kochhar, both of Katy, Tex., assignors to Gulf Oil Corporation, Pittsburgh, Pa.

Division of Ser. No. 112,026, Jan. 14, 1980, Pat. No. 4,251,389. This application Jul. 10, 1980, Ser. No. 168,835

Int. Cl.³ C08F *4/64, 10/06*

U.S. Cl. 526—138 **4 Claims**

1. In a process for the polymerization of propylene by contacting propylene with a titanium chloride catalyst and an aluminum alkyl cocatalyst, said titanium chloride catalyst having been prepared by treating titanium tetrachloride with an aluminum alkyl to reduce the titanium to a lower valence state and then heating the reduced titanium chloride in a liquid hydrocarbon in the presence of a Lewis base; the improvement which consists of passing carbon dioxide through the hydrocarbon medium while the reduced titanium chloride is being treated with the Lewis base, the duration of the carbon dioxide treatment being sufficient to enhance the productivity of said titanium chloride in the polymerization of propylene.

4,330,653

PROCESS FOR THE POLYMERIZATION OF VINYL CHLORIDE IN AN AQUEOUS PHASE

Heinz Klippert, Burgkirchen, and Dieter Ulmschneider, Königstein, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Filed Jan. 26, 1981, Ser. No. 228,137

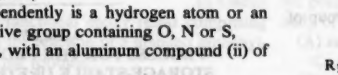
Claims priority, application Fed. Rep. of Germany, Feb. 2, 1980, 3003778

Int. Cl.³ C08F *2/20, 14/06*

U.S. Cl. 526—200 **8 Claims**

1. Process for the polymerization of vinyl chloride in an aqueous phase, in the presence of 0 to 20% by weight, relative to monomers employed, of monomers which can be copolymerized with vinyl chloride, oil-soluble activators which decompose to form free radicals, and a mixture of high-molecular, surface-active suspending agents at 30° to 80° C., which comprises using 0.05 to 1% by weight, relative to monomers employed, of a mixture of suspending agents which is composed of

(a) 10 to 90% by weight, relative to the mixture, of a copolymer having a viscosity of 1×10^{-3} to 50×10^{-3} Pa·s, determined in a 2% strength by weight solution in isopropanol at 25° C., and consisting of 10 to 50% by weight, relative to the copolymer, of polymerized units of at least one compound of the formula



(I)

wherein R_1 is [illegible] or denotes an alkyl radical having 1 to 4 C atoms, R_2 is H or denotes CH_3—, and 50 to 90% by weight, relative to the copolymer, of polymerized units of vinyl acetate, and of

(b) 90 to 10% by weight, relative to the mixture of suspending agents, of at least one suspending agent selected from the following substances: methylcellulose, methylhydroxyethylcellulose or methylhydroxypropylcellulose having a molecular degree of substitution by the methoxy group of about 1.4 to about 2.4 and a molar degree of substitution by the hydroxyalkoxy group, if present, of about 0.08 to about 0.28; or hydroxyethylcellulose or hydroxypropylcellulose having a molar degree of substitution of about 1 to about 3.5; or aminoethylhydroxypropylcellulose hav-

ing a molar degree of substitution by the aminoethyl group of about 0.5 to about 1 and by the hydroxypropyl group of about 3 to about 5, the 2% strength by weight aqueous solution of the said cellulose ethers having a viscosity at 20° C. of 20×10^{-3} to 500×10^{-3} Pa·s, or partly acetylated polyvinyl alcohols having an acetate content of 5 to 25% by weight and a viscosity in a 4% strength by weight aqueous solution at 20° C. of 2×10^{-3} to 100×10^{-3} Pa·s.

4,330,654

NOVEL POLYMERS HAVING ACID FUNCTIONALITY

Bobby R. Ezzell, Lake Jackson; William P. Carl, Angleton, and William A. Mod, Lake Jackson, all of Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed Jun. 11, 1980, Ser. No. 158,425

Int. Cl.³ C08F 214/02, 214/16, 214/18

U.S. Cl. 526—243 **18 Claims**

1. Polymers useful as ion exchange membranes produced from the free radical initiated co-polymerization of at least three monomers wherein at least one monomer is selected from a first group consisting of tetrafluoroethylene, trifluoromonochloroethylene, trifluoroethylene, vinylidene fluoride, 1,1-difluoro-2,2-dichloroethylene, 1,1-difluoro-2-chloroethylene, hexafluoropropylene, 1,1,1,3,3-pentafluoropropylene, octafluoroisobutylene, ethylene, vinylchloride, trifluoronitrosomethane, perfluoronitrosoethane and alkyl vinyl ether, and at least one other monomer is selected from a second group represented by the general formula:

$$Y(CF_2)_a(CFR_f)_b(CFR'_f)_cO\left(\begin{array}{l}CF-CF_2-O\\ |\\ CF_2X\end{array}\right)_n-CF=CF_2$$

where:

Y is an acid group or an acid derivative easily convertible to an acid group;

a is zero to three;

b is zero to three;

c is 0 or 1;

$a+b+c\neq0$;

X is Cl or Br or mixtures thereof when $n>1$;

n is zero to six; and

R_f and R'_f are independently selected from the group consisting of F, Cl, perfluoroalkyl radical and fluorochloroalkyl radical; and

at least one other monomer is selected from a third group of monomers represented by the general formula:

$$Y'(CF_2)_{a'}(CFR_f)_{b'}(CFR'_f)_{c'}O\left(\begin{array}{l}CF-CF_2-O\\ |\\ CF_2X'\end{array}\right)_{n'}-CF=CF_2$$

where:

Y' is Cl or Br;

a' is zero to three;

b' is zero to three;

c' is zero or one;

$a'+b'+c'\neq0$;

X' is F, Cl, Br, or mixtures thereof when $n'>1$;

n' is zero to six; and R_f and R'_f are independently selected from the group consisting of F, Cl, perfluoroalkyl radical and chloroperfluoro alkyl radical.

4,330,655

HIGH SOFTENING POINT SYNTHETIC RESIN

Herbert L. Bullard, Norton, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Jan. 29, 1979, Ser. No. 7,119

Int. Cl.³ C08F 240/00, 236/02

U.S. Cl. 526—283 **2 Claims**

1. A synthetic hydrocarbon resin having a softening point (Ring and Ball) greater than 130° C. and up to about 160° C., a molecular weight of about 1500 to 2000 and being soluble in a low boiling Kauri butanol solvent.

4,330,656

ACTIVATED ISOCYANATE PREPOLYMERS AND A PROCESS FOR THE PRODUCTION OF ELASTOMERIC POLYURETHANE RESINS

Gerhard Grögler, Leverkusen, and Wilhelm Kallert, Cologne, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

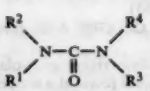
Filed Oct. 4, 1979, Ser. No. 81,982

Claims priority, application Fed. Rep. of Germany, Oct. 6, 1978, 2843739

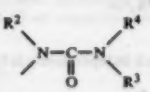
Int. Cl.³ C08G 18/32, 18/76

U.S. Cl. 528—52 **8 Claims**

1. In a process for the production of polyurethane elastomers by the reaction of 1,5-naphthylene diisocyanate with a substantially linear, relatively high molecular weight polyhydroxyl compound to produce a prepolymer containing isocyanate groups, followed by a reaction with a chain lengthening agent in the presence of an activator, the improvement wherein the activator used is a compound corresponding to the general formula:



wherein R^1 represents an alkyl, cycloalkyl, aralkyl or aryl group with 1 to 15 carbon atoms which may be substituted by a urea group corresponding to the general formula:



wherein R^2, R^3 and R^4 represent hydrogen, phenyl groups or straight or branched chain alkyl groups having 1 to 6 carbon atoms, and wherein the operating conditions employed are such that substantially homogeneous elastomers are obtained.

4,330,657

PROCESS FOR THE PRODUCTION OF STORAGE-STABLE URETHANE ACRYLS

Josef Disteldorf, Herne; Werner Flakus, Recklinghausen, and Horst Schnurbusch, Herne, all of Fed. Rep. of Germany, assignors to Chemische Werke Huls Aktiengesellschaft, Recklinghause, Fed. Rep. of Germany

Filed Dec. 17, 1979, Ser. No. 104,669

Claims priority, application Fed. Rep. of Germany, Feb. 12, 1979, 2905205

Int. Cl.³ C08G 18/75, 18/67; C08F 283/00; C08G 63/76

U.S. Cl. 528—58 **11 Claims**

1. A process for producing storage-stable urethane lacquers which comprises:

(A) forming a prepolymer by reacting one isocyanate group of a cycloaliphatic diisocyanate having 2 isocyanate groups of substantially different reactivity, with the hydroxy group of a mono hydroxy group containing acrylic

compound which is polymerizable by addition, wherein the temperature is about 0°–50° C. and the reaction is carried out in the presence of 0.001–0.01% by weight on the basis of tin of an organic tin catalyst;

(B) reacting said prepolymer with a multifunctional polyol or mixtures thereof, in an equivalent ratio of NCO:OH of 2:1, in the presence of 0.01–0.1% by weight on the basis of tin of an organic tin catalyst;

to thereby obtain a substantially NCO-free urethane acryl.

4,330,658

CURABLE RESIN COMPOSITION

Nobuyuki Ikeguchi, and Hidenori Kimbara, both of Tokyo, Japan, assignors to Mitsubishi Gas Chemical Company, Inc., Tokyo, Japan

Filed Dec. 22, 1980, Ser. No. 218,673
Claims priority, application Japan, Dec. 24, 1979, 54-167871
Int. Cl.³ C08G 18/28, 18/77
U.S. Cl. 528—73 9 Claims

1. In a curable resin composition comprising a mixture and/or a preliminary reaction product of:

(A) at least one component selected from the group consisting of:

(i) a polyfunctional cyanate ester monomer having the formula:

R—O—C≡N)m

wherein m is an integer of 2 to 5 and R is an aromatic organic group, the cyanate groups being directly bonded to the aromatic nucleus of said aromatic organic group,

(ii) a prepolymer of (i), and

(iii) a coprepolymer of (i) and an amine; and

(B) another compound,

the improvement wherein said another compound is a polyamideimide obtainable by the reaction of trimellitic anhydride with aromatic diamine or aromatic diisocyanate, or the reaction of pyromellitic anhydride, aromatic diamine and aromatic dicarboxylic acid or aromatic aminocarboxylic acid.

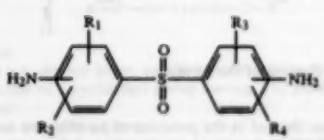
4,330,659

MODIFIED AMINE HARDENER SYSTEMS

John J. King, East Haven, Conn.; Ralph F. Sellers, Somerset, N.J., and Richard N. Castonguay, Danbury, Conn., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation-in-part of Ser. No. 194,094, Oct. 6, 1980, abandoned. This application May 26, 1981, Ser. No. 267,117
Int. Cl.³ C08G 59/50
U.S. Cl. 528—99 11 Claims

1. A hardener for polyfunctional epoxy resins comprising the adduct obtained from the reaction of a diamino diphenylsulfone corresponding to the formula



wherein R_1, R_3, R_3 and R_4 are independently hydrogen, straight and branched chain alkyl of 1 to 12 carbons or halogen,

and a diglycidyl ether of a polyhydric phenol; said hardener having from about 2.5 to 100 equivalents of aminohydrogen per equivalent of epoxy.

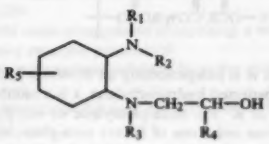
4,330,660

SUBSTITUTED 1,2-DIAMINOCYCLOHEXANES AND USE AS EPOXY CURING AGENTS

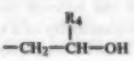
Edward W. Kluger, Pauline, and Tien-Kuei Su, Spartanburg, both of S.C., assignors to Milliken Research Corporation, Spartanburg, S.C.

Filed Jan. 16, 1981, Ser. No. 225,842
Int. Cl.³ C08G 59/64
U.S. Cl. 528—111 12 Claims

1. Nitrogen-containing compounds having the following formula:



where R_1, R_2 and R_3 are independently selected from H and



wherein R_4 and R_5 are each independently selected from H and a lower alkyl group having from 1 to about 4 carbon atoms.

4,330,661

COPOLYESTERS, METHOD OF MAKING SAME AND PACKAGING MATERIALS

Santos W. Go, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed Feb. 8, 1980, Ser. No. 119,895
The portion of the term of this patent subsequent to Apr. 1, 1997, has been disclaimed.
Int. Cl.³ C08G 63/18
U.S. Cl. 528—173 11 Claims

1. A thermoplastic copolyester, having an inherent viscosity of over 0.65 dl/gm, a Tg of at least 82° C. and a melting point peak of at least 220° C., which is the solid state polycondensation reaction product of a thermoplastic copolyester which is the polymeric reaction product of reactants consisting essentially of

(A) reactant(s) selected from terephthalic acid and its C_1 to C_4 alkyl esters, with

(B) reactants, bis(4-β-hydroxyethoxyphenyl)sulfone and ethylene glycol,

wherein the amount of said bis(4-β-hydroxyethoxyphenyl)sulfone is 2–12 mol percent of the amount A of reactant(s), the combined amount of B reactants is about 110 to 300 mol percent of the amount of A reactant(s), prepared by melt polymerization to yield a copolyester having a lower inherent viscosity which is in the range 0.2 to 0.7 dl/gm.,

said solid state copolyester being more resistant to decomposition in the molten state to form acetaldehyde than (1) the same copolyester of the same or lower inherent viscosity but made entirely by polymerization and condensation in the molten state or (2) poly(ethylene terephthalate) made by solid state polycondensation or by melt polymerization.

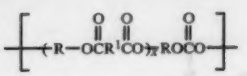
4,330,662

ORDERED COPOLYESTERCARBONATE RESINS

Stephen E. Bales, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Oct. 27, 1980, Ser. No. 200,759
Int. Cl.³ C08G 63/12
U.S. Cl. 528—176 3 Claims

1. A normally solid ordered copolyestercarbonate having repeating units of the formula:



wherein each R is independently an aromatic hydrocarbylene or inertly substituted hydrocarbylene, x is a number from 0.05 to 10, some of R^1 are meta-phenylene or inertly substituted meta-phenylene and some of R^1 are para-phenylene or inertly substituted para-phenylene provided that the ratio of meta-phenylene or inertly substituted meta-phenylene to para-phenylene or inertly substituted para-phenylene is such that the melt processability of the ordered copolyestercarbonate is better than the melt processability of a similar copolyestercarbonate wherein all of R^1 are para-phenylene or inertly substituted para-phenylene.

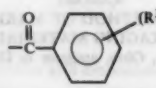
4,330,663

BENZOATE ESTER TERMINATED POLYESTER-CARBONATE

Niles R. Rosenquist, Evansville, Ind., assignor to General Electric Company, Mt. Vernon, Ind.

Filed Dec. 31, 1980, Ser. No. 221,663
Int. Cl.³ C08G 63/64
U.S. Cl. 528—176 21 Claims

1. An aromatic polyester-carbonate polymer containing as terminal groups benzoyl radicals represented by the formula



wherein n is an integer having a value from 0 to 5 inclusive; and each R^3 is independently selected from the group consisting of alkyl radicals, aryl radical, alkaryl radical, aralkyl radicals, alkoxy radicals, aryloxy radicals, halides, $—NO_2$,

radicals wherein R^4 is selected from hydrogen, alkyl radicals and acyl radicals and R^5 is an acyl radical, and —C≡N.

4,330,664

POLYCARBONATE TRANSESTERIFICATION WITH CATALYST CONTAINING ALUMINUM HYDRIDE OR BOROHYDRIDE GROUP

Daniel J. Brunelle, Scotia, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Continuation-in-part of Ser. No. 106,856, Dec. 26, 1979, abandoned. This application Apr. 27, 1981, Ser. No. 258,124
Int. Cl.³ C08G 63/62
U.S. Cl. 528—198 11 Claims

1. In a process of preparing a high molecular weight polycarbonate by reacting at least one bis(aryl)carbonate with at least one dihydric phenol in the presence of a transesterification catalyst, the improvement wherein the catalyst is (1) a borohydride having the general formula:

$$MBH_nR_{4-n}$$

wherein M is selected from the class consisting of an alkali metal, an alkaline earth metal, a quaternary hydrocarbon ammonium, a quaternary hydrocarbon phosphonium and a tertiary hydrocarbon sulfonium group, n is a number of from 1 to 4, and R is a hydrocarbon or hydrocarbonoxy group, or (2) an aluminum hydride having the general formula:

$$MAlH_nR_{4-n}$$

wherein M, n and R are the same as described above.

4,330,665

PROCESS FOR THE PREPARATION OF AROMATIC POLYCARBONATES

Heinrich Krimm; Hans-Josef Buysch, both of Krefeld, and Hans Rudolph, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Apr. 21, 1981, Ser. No. 256,227
Claims priority, application Fed. Rep. of Germany, May 7, 1980, 3017419
Int. Cl.³ C08G 63/62
U.S. Cl. 528—200 8 Claims

1. In the process for the preparation of aromatic polycarbonates by the transesterification of diphenols and carbonic acid dialkyl ester, the improvement comprising the presence of

(a) organo-tin-IV compound and

(b) a monophenol.

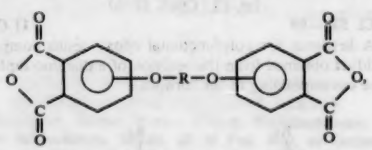
4,330,666

METHOD FOR MAKING POLYETHERIMIDES

Dwain M. White, Schenectady, N.Y., and David G. Keyes, Minneapolis, Minn., assignors to General Electric Company, Schenectady, N.Y.

Filed Sep. 19, 1980, Ser. No. 188,756
Int. Cl.³ C08G 73/10
U.S. Cl. 528—207 9 Claims

1. A method for making polyetherimide which comprises effecting the intercondensation of aromatic bis(ether anhydride) of the formula,



and organic diamine of the formula,

$$H_2NR^1NH_2$$

or prepolymer thereof in the presence of an effective amount of a compatible amphoteric catalyst selected from the class consisting of hydroxypyridines and aliphatic amino carboxylic acids, where R is a divalent aromatic organic radical having from 6-30 carbon atoms and R^1 is a divalent organic radical selected from R radicals, alkylene radicals having from 2-20 carbon atoms, cycloalkylene radicals and $C_{(2-8)}$ alkylene terminated polydiorganosiloxanes.

4,330,667

RESINOUS POLYMERIC SUBSTANCES

John L. Job, Pinetown, and Peter S. Shaw, Randburg, both of South Africa, assignors to National Chemical Products Limited, Johannesburg, South Africa

Filed Mar. 8, 1979, Ser. No. 18,555
Claims priority, application South Africa, Mar. 13, 1978, 79/1454
Int. Cl.³ C08G 12/06
U.S. Cl. 528—266 35 Claims

1. A resinous polymeric substance for use as an aid in froth flotation characterized in that it:

has a mean molecular weight as determined ebulliometrically or by size-exclusion chromatography in the range 250–10 000;

includes carbon (C), hydrogen (H), nitrogen (N), and oxygen (O), and has an elemental analysis falling within the ranges:

ELEMENT	% m/m (by mass)
C	60–80
H	4–12
N	5–15
O	2–25

has a viscosity falling within the range 10 000–100 000 centipoise (cps) at 20° C. and within the range 100–1 000 cps at 70° C.;

has an infra-red (IR) spectrum including broad weak band occurring in the wavenumber range 2600 cm^{-1} to 2450 cm^{-1} and a broad strong group of bands occurring in the wavenumber range 1700 cm^{-1} to 1550 cm^{-1}.

8. A method of making a resinous polymeric substance as claimed in claim 1, characterized in that it comprises reacting a carbonyl compound with an amine (defined to include ammonia) followed by heating to a temperature above 50° C., the carbonyl compound having a single carbonyl group and being mixed with the amine starting material, the reaction mixture being heated by autoclaving it under pressure in a pressure reactor to said temperature above 50° C.

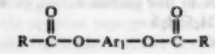
4,330,668

PROCESS FOR PRODUCING AROMATIC POLYESTER WITH TRANSITION METAL SALT OF NAPHTHENIC ACID

Sato Hideo, Nobeoka; Takiguchi Teruo, Nakagun; Akimoto Norio, and Ueno Ikuo, both of Nobeoka, all of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed May 16, 1980, Ser. No. 150,397
Int. Cl.³ C08G 63/00
U.S. Cl. 528—271 13 Claims

1. In the production of a shaped article-forming aromatic polyester by polymerizing a composition comprising (1) an aromatic diester reactant of the formula

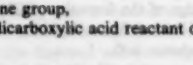


wherein

R is a hydrogen atom, an alkyl group having 1 to 6 carbon atoms or a cycloalkyl group having 3 to 8 carbon atoms, and

Ar_1 is an arylene group,

(2) an aromatic dicarboxylic acid reactant of the formula



wherein

Ar_2 is an arylene group,

and (3) a catalyst, the improvement wherein the catalyst is a transition metal salt of naphthenic acid.

4,330,669

CURABLE RESIN COMPOSITION

Nobuyuki Ikeguchi, and Yasunori Ozaki, both of Tokyo, Japan, assignors to Mitsubishi Gas Chemical Company, Inc., Tokyo, Japan

Filed Dec. 22, 1980, Ser. No. 218,674
Claims priority, application Japan, Dec. 24, 1979, 54-167869
Int. Cl.³ C08G 69/44, 73/16
U.S. Cl. 528—289 9 Claims

1. In a curable resin composition comprising a mixture and/or a preliminary reaction product of:

(A) at least one component selected from the group consisting of

(i) a polyfunctional cyanate ester monomer having the formula:

wherein m is an integer of 2 to 5 and R is an aromatic organic group, the cyanate groups being directly bonded to the aromatic nucleus of said aromatic organic group,

(ii) a prepolymer of (i), and

(iii) a coprepolymer of (i) and an amine; and

(B) another compound, the improvement wherein said another compound is a polyester imide resin obtainable by (1) forming an imide ring by reaction between trimellitic anhydride, amino-alcohol or aromatic diamine and converting the reaction product to an ester by optional addition of a diol or dicarboxylic acid, (2) reacting a polyester having a terminal OH or acid with aromatic diamine and trimellitic anhydride, or (3) forming bis phthalic anhydride from aromatic diol and trimellitic anhydride and reacting the anhydride with diamine.

4,330,670

COPOLYESTER ADHESIVES

Bobby J. Sublett, Kingsport, Tenn., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed May 26, 1981, Ser. No. 267,102
Int. Cl.³ C08G 63/16
U.S. Cl. 528—302 12 Claims

1. A crystalline copolyester derived from 100 mole % of a dibasic acid component and 100 mole % of a glycol component, said dibasic acid component comprising at least 40 mole % of 1,4-cyclohexanedicarboxylic acid at least 80% of which is the trans-isomer, and said glycol component comprising at least 50 mole % 1,4-butanediol, said copolyester characterized by having a melting point of about 40°–130° C., a glass transition temperature of about −20° C. to about 40° C., a heat of fusion of greater than 1.0 calorie per gram, and a crystalline half time of less than 10 minutes at maximum crystallization temperature.

4,330,671

POSITIVE RESIST FOR ELECTRON BEAM AND X-RAY LITHOGRAPHY AND METHOD OF USING SAME

Thomas R. Pampalone, Belle Mead, N.J., assignor to RCA Corporation, New York, N.Y.

Division of Ser. No. 76,673, Sep. 18, 1979, Pat. No. 4,262,083. This application Nov. 14, 1980, Ser. No. 206,716
The portion of the term of this patent subsequent to Apr. 14, 1998, has been disclaimed.
Int. Cl.³ C08G 75/00
U.S. Cl. 528—382 8 Claims

1. A copolymer of an aziridine and sulfur dioxide.

4,330,672

THERMOPLASTIC ELASTOMER POWDER COATINGS

Martin J. Hannon, Martinsville; Rajal M. Vyas, North Plainfield, and Rudolph R. Schwarz, West Orange, all of N.J., assignors to Celanese Corporation, New York, N.Y.

Filed Oct. 28, 1980, Ser. No. 201,658
Int. Cl.³ C08C 2/02, 3/02
U.S. Cl. 528—493 6 Claims

1. A process for preparing powder particles of thermoplastic elastomer which consists essentially of:

(a) forming a suspension of a thermoplastic elastomer in a poor solvent, said thermoplastic elastomer comprising a block copolymer having at least two kinds of polymer blocks wherein one polymer block is designated by A and a second polymer block is designated by B such that each A is a polymer end block of a monovinyl arene or alpha alkyl monovinyl arene and each B is a polymer mid block derived from a conjugated diene, and said poor solvent being a polar organic liquid which is non-reactive with the thermoplastic elastomer and possesses a solubility parameter (δ) of from about 110 to about 122% of the solubility parameter of the monovinyl arene or alpha alkyl monovinyl arene polymer comprising block A of said thermoplastic elastomer; and refluxing said suspension in a manner and for a time sufficient to reduce said thermoplastic elastomer to fine agglomerated particles;

(b) adding said suspension to a non-solvent to form a mixture of thermoplastic elastomer particles, poor solvent, and non-solvent, and subjecting said mixture to high shear mixing for a period of time sufficient to produce particles having an average diameter of less than about 100 microns and to render said thermoplastic elastomer particles hard, discrete and non-tacky;

(c) recovering said thermoplastic elastomer polymer particles.

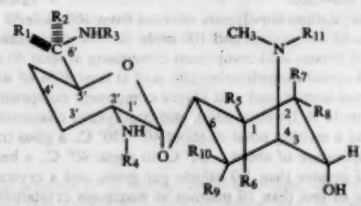
4,330,673

PROCESS FOR PRODUCING 3-O-DEMETHYLAMINOGLYCOSIDE AND NOVEL 3-O-DEMETHYLFORTIMICIN DERIVATIVES

William Rosenbrook, Jr., Libertyville, Ill., assignor to Abbott Laboratories, Chicago, Ill.

Continuation-in-part of Ser. No. 25,238, Mar. 29, 1979, Pat. No. 4,230,848. This application Mar. 3, 1980, Ser. No. 126,731
Int. Cl.³ C07H 15/22
U.S. Cl. 536—16.1 43 Claims

27. A 3-O-demethylfortimicin represented by the formula:



wherein: R_1 and R_2 are hydrogen or methyl with the limitation that one of either R_1 or R_2 must be hydrogen; R_3 is hydrogen or methyl; R_4 and R_{11} are the same or different members of the group consisting of hydrogen, acyl of the formula

wherein R_{12} is loweralkyl, aminoacyl, diaminoacyl, N-loweralkylaminoacyl, N,N-diloweralkylaminoacyl, hydroxy-substituted aminoacyl, loweralkyl, aminoloweralkyl, diaminoloweralkyl, hydroxyloweralkyl, N-loweralkylaminoloweralkyl, N,N-diloweralkylaminoloweralkyl, N-loweralkylaminohydroxyloweralkyl, and N,N-diloweralkylaminohydroxyloweralkyl; R_5 and R_6 are hydrogen or amino with the limitation that one of either R_5 and R_6 must be hydrogen; R_7 and R_8 are selected from the group consisting of hydrogen, hydroxy, amino and chloro with the limitation that one of either R_7 or R_8 must be hydrogen; R_9 and R_{10} are hydrogen or hydroxy with the limitation that one of either R_9 and R_{10} must be hydrogen; excluding compounds wherein R_1 is hydrogen, R_2 is methyl, R_3 is hydrogen, R_5 is amino, R_8 is hydroxy and R_{10} is hydrogen when position 4'–5' is saturated; and excluding all C_4 and C_2-derivatives when R_1 is hydrogen, R_2 is methyl, R_3 is hydrogen, R_5 is amino R_8 is hydroxy and R_{10} is hydroxy when position 4'–5' is saturated; and the pharmaceutically acceptable salts thereof.

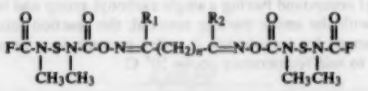
4,330,674

CARBAMOYL SULFIDE FLUORIDES

Jiin-Duey Cheng, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

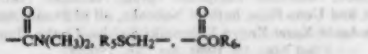
Division of Ser. No. 139,836, Apr. 24, 1980, Pat. No. 4,254,141, which is a continuation-in-part of Ser. No. 18,293, Mar. 6, 1979, abandoned. This application Oct. 8, 1980, Ser. No. 195,084
Int. Cl.³ C07D 339/00, 339/08; C07C 153/09, 145/04
U.S. Cl. 549—11 1 Claim

1. A compound of the formula



wherein

R_1 is hydrogen, C_1–C_4 alkyl, C_5–C_6 cycloalkyl, C_1–C_3 alkylthio, chlorine, chloromethyl,



phenyl or phenyl substituted with C_1–C_4 alkyl;

R_2 is hydrogen, C_1–C_4 alkyl, C_3–C_6 cycloalkyl, chlorine, C_1–C_3 alkylthio, phenyl or phenyl substituted with C_1–C_4 alkyl;

R_1 and R_2 can be taken together to form a carbocyclic bridge of three to five carbon atoms, or a bridge of the formula —SCH_2CH_2S—;

R_5 is C_1–C_3 alkyl;

R_6 is C_1–C_6 alkyl and

n is o, 1 or 2;

provided that n is 0 when

(1) R_1 is chloromethyl or R_4SCH_2, or

(2) R_1 and R_2 are taken together to form a carbocyclic bridge or a bridge of the formula —SCH_2CH_2S—, or

(3) at least one of R_1 and R_2 is alkylthio;

and provided that when n is 0,

one of R_1 and R_2 cannot be H when the other is phenyl or phenyl substituted with C_1–C_4 alkyl;

and further provided that when n is 1,

R_1 and R_2 cannot both be t-butyl, phenyl, phenyl substituted with C_1–C_4 alkyl or a combination thereof.

4,330,675

HALOGENATED ESTERS

Roger K. Huff, Wokingham, England, assignor to Imperial Chemical Industries Limited, London, England

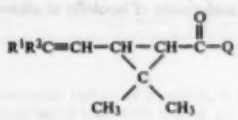
Division of Ser. No. 869,615, Jan. 16, 1978, Pat. No. 4,183,948. This application Jul. 24, 1979, Ser. No. 60,165

Claims priority, application United Kingdom, Jan. 24, 1977, 2763/77; Mar. 23, 1977, 12210/77; Sep. 2, 1977, 36714/77; Sep. 2, 1977, 36715/77

Int. Cl.³ C07C 69/743, 61/35

U.S. Cl. 560—124 29 Claims

1. A compound of formula:



wherein one of R^1 and R^2 represents a group of formula:

$$W-(CF_2)_m-$$

where W represents an atom of hydrogen, fluorine or chlorine and m has the value one or two, and the other of R^1 and R^2 represents an atom of fluorine, chlorine or bromine, or a group of formula:

where each of X, Y and Z independently represents an atom of hydrogen, fluorine or chlorine, and Q represents the hydroxy group, a lower alkoxy group containing up to six carbon atoms or the chlorine or bromine atom.

4,330,676

OXIDATION PROCESS

Peter H. Moxham, Middlesbrough, England, assignor to Imperial Chemical Industries Limited, London, England

Filed Jun. 22, 1978, Ser. No. 918,266

Claims priority, application United Kingdom, Jul. 4, 1977, 27887/77

Int. Cl.³ C07C 51/16

U.S. Cl. 562—416 17 Claims

1. A continuous process for the oxidation of an aromatic compound substituted by at least one alkyl, hydroxyalkyl or formyl group to an aromatic carboxylic acid which comprises introducing into a reaction zone the substituted aromatic compound, a solvent, a heavy metal oxidation catalyst and oxygen or a molecular oxygen-containing gas, maintaining the resulting mixture in the reaction zone at a temperature and pressure at which the said oxidation reaction is effected in the liquid phase to produce a reaction slurry of solid said aromatic acid in mother liquor comprising said solvent, holding said reaction slurry in a washing zone to allow solid said aromatic acid to separate under gravity from said mother liquor into fresh said solvent fed to the bottom of the washing zone and withdrawing from said washing zone a washed slurry of solid said aromatic acid in said solvent, in which said washing zone is substantially vertically disposed and is elongated in the vertical direction and the feed of fresh solvent to the bottom of the washing zone is greater than that which is just sufficient to supply the liquor for the withdrawn slurry, mother liquor from which the aromatic carboxylic acid settles out being withdrawn from an upper region of the washing zone.

4,330,677

POLYETHER COMPOUNDS, THEIR PRODUCTION AND THEIR MEDICINAL USE

Siegfried Linke; Mithat Mardin; Hans P. Krause, and Rudiger Sitt, all of Wuppertal, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

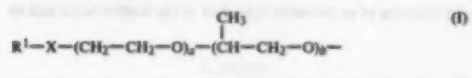
Filed Oct. 31, 1979, Ser. No. 89,839

Claims priority, application Fed. Rep. of Germany, Nov. 18, 1978, 2850058

Int. Cl.³ C07C 59/00

U.S. Cl. 562—583 16 Claims

1. A polyether derivative of the formula



(I)

or a salt therof, in which

X in each case denotes oxygen, sulphur or a NH or N-alkyl group containing 1 to 4 carbon atoms;

R^1 denotes an alkyl or alkenyl with up to 12 carbon atoms, cycloalkyl or cycloalkenyl, with 5 to 8 ring members, mono- or bi-cyclic carbocyclic aryl, or aralkyl group in which the aryl portion is mono or bi-cyclic carbocyclic aryl and the alkyl portion contains 1 to 4 carbon atoms, these groups being optionally substituted by nitro, cyano, azido, halogen trifluoromethyl, trifluoromethoxy, phenyl, hydroxyl, amino, alkyl with up to 12 carbon atoms, alkoxy with up to 12 carbon atoms, alkoxycarbonyl with up to 12 carbon atoms, acyloxy, acylamino, hydroxyl, carboxyl, or SO_2-alkyl and a, b, and c are integers which are chosen such that an average molecular weight of 4,000 results and that the propylene oxide proportion (b) is 70% and the ethylene oxide proportion (a) and (c) is 30%.

4,330,678

PROCESS FOR THE HYDROFORMYLATION OF OLEFINS

Petrus W. N. M. Van Leeuwen, and Cornelis F. Roobeek, both of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Filed Dec. 8, 1980, Ser. No. 213,971

Claims priority, application United Kingdom, Feb. 4, 1980, 8003616

Int. Cl.³ C07C 45/50, 47/02

U.S. Cl. 568—454 13 Claims

1. A process for the hydroformylation of an olefin to a high percentage of normal aldehydes which comprises reacting an olefin with carbon monoxide and hydrogen in the presence of a complex of rhodium with a compound of the formula:

$$L(OR^1)(OR^2)(OR^3)$$

wherein L is P or As and R^1, R^2 and R^3 are (dis)similar alkyl, aryl, alkaryl or aralkyl groups, provided that at least one of R^1, R^2 or R^3 represents a group $-CH_n[CFXY]_{3-n}$ wherein n is 1 or 2 and either

(a) X and Y both represent F, or

(b) one of X and Y represents F and the other represents H or Cl or an (un)substituted (ar)alkyl group, or

(c) X represents H or Cl or an (un)substituted (ar)alkyl group and Y represents and (ar)alkyl group whose connecting carbon atom carries at least one F,

which hydroformylation reaction is carried out at a temperature in the range of from about 50° C. to about 200° C.

4,330,679

PROCESS FOR THE PREPARATION OF ALKYL TERT.-ALKYL ETHERS

Hans-Dieter Köhler, and Bernhard Schleppinghoff, both of Dormagen, Fed. Rep. of Germany, assignors to EC Erdölchemie GmbH, Cologne, Fed. Rep. of Germany

Filed Jun. 24, 1981, Ser. No. 276,761

Claims priority, application Fed. Rep. of Germany, Jul. 12, 1980, 3026504

Int. Cl.³ C07C *41/06*

U.S. Cl. 568—697 14 Claims

1. In a process for the preparation of an alkyl tert.-alkyl ether by reaction of an isoolefin branched at the double bond and an alkanol in the presence of a cation exchanger, the improvement which comprises:

(a) employing as the cation exchanger a macroporous or gelatinous acid cation exchanger in the H^+ form which has been charged with 0.1 to 5 grams, per one liter of dry cation exchanger, of an elementary form of a metal of sub-groups VI, VII or VIII of the periodic table of elements (Mendeleev) which cation exchanger is crosslinked with the degree of crosslinking of 2 to 65% and has a specific surface area of 5 to 750 square meters per gram on the basis of dry cation exchange resin; and

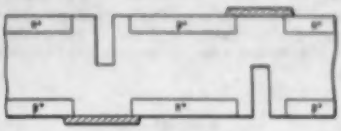
(b) the reaction is carried out in the liquid phase at a temperature of 30° to 140° C. at a pressure of 2 to 100 bars employing a molar ratio of isoolefin to alkanol of 0.1 to 5.

4,330,680

INTEGRATED SERIES-CONNECTED SOLAR CELL

Adolf Goetzberger, Merzhausen, Fed. Rep. of Germany, assignor to Fraunhofer Gesellschaft zur Forderung der angewandten Forschung e.v., Munich, Fed. Rep. of Germany

Filed Oct. 28, 1980, Ser. No. 201,644
Int. Cl.[3] H01L *31/06*
U.S. Cl. 136—247 13 Claims



1. An integrated solar cell array in which, in a semiconductor substrate, a number of solar cells having p-n transitions are arranged to form a series of semiconductor junctions, built up normal to the plane of the semiconductor substrate, spaced at intervals and in a row parallel to the plane of the semiconductor substrate, and in which the solar cells are series-connected by printed circuit tracks deposited on the semiconductor substrate in contact with the semiconductor junctions, characterized in that, on each of the two surfaces of a semiconductor substrate possessing a high ohmic resistance, a row of strip-shaped semiconductor junctions is arranged, these junctions having p^+- and n^+-conduction characteristics in alternation and being parallel to each other and spaced at intervals, in such a way that a unit solar cell comprising a semiconductor junction forming layer having a p^+-conduction characteristic on one surface of the semiconductor substrate is, in each case, located opposite a semiconductor junction forming layer having an n^+-conduction characteristic on the other surface, in that said printed circuit tracks are arranged, in alternation, on one surface and on the other surface of the semiconductor substrate, these tracks connecting, in each case, one solar cell unit with a neighboring unit, in series-connection, and means for electrically separating neighboring junctions which are not interconnected by said printed circuit tracks said separating means being located in the spaces between said unconnected junctions.

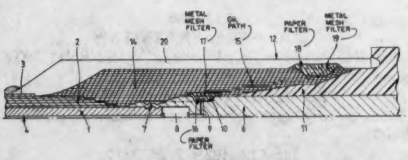
8. An array according to claim 1, wherein it is used in combination with a fluorescence collector.

4,330,681

FLUID-FILLED ELECTRIC CABLE JOINTS AND TERMINATIONS WITH FILTERING MEANS

Brian Gregory, Dartford, England, assignor to BICC Limited, London, England

Filed Aug. 18, 1980, Ser. No. 178,790
Int. Cl.[3] H02G *15/22, 15/24*
U.S. Cl. 174—14 R 19 Claims



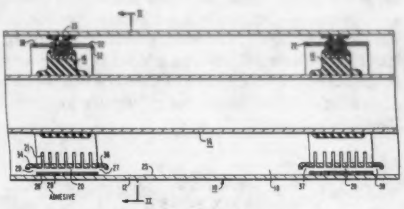
1. A fluid-filled electric cable joint in which the jointed cable conductors are housed in a joint enclosure, in which the dielectric of each cable conductor connected at the joint includes a dielectric fluid which is free to flow along the cable conductor and the insulation of each cable conductor at the joint is a laminated body of helically lapped tapes of insulating material, and in which at least one path is provided for free flow of the dielectric fluid from each cable conductor into the shape bounded by the joint enclosure or vice versa, wherein each said path is defined by a boundary wall of which at least a part, extending between the cable conductor and said space, is of a fibrous insulating material, and filtering means provided at at least one end of each said path, for filtering from the flowing dielectric fluid particles of metal and other undesirable materials that may be carried by the fluid, said filtering means comprising, in combination, electrically insulating filtering material and a fine metallic mesh, serving as an electrical screen.

4,330,682

HYBRID PARTICLE TRAPS AND CONDITIONING PROCEDURE FOR GAS INSULATED TRANSMISSION LINES

Steinar J. Dale, Monroeville, and Alan H. Cookson, Churchill, both of Pa., assignors to The United States of America as represented by the Department of Energy, Washington, D.C.

Filed Nov. 14, 1980, Ser. No. 206,755
Int. Cl.[3] H01B *9/06, 9/04;* H02G *5/06;* B08B *7/02*
U.S. Cl. 174—14 R 13 Claims



1. A gas insulated transmission line comprising:
an elongated cylindrical outer sheath at low electrical potential;
an inner conductor at high electric potential with respect to said outer sheath disposed within said outer sheath;
an insulating gas electrically insulating said inner conductor from said outer sheath;
means for insulatably supporting said inner conductor within said outer sheath;
an apertured particle trapping ring disposed within, and electrically connected to, said outer sheath, said particle trapping ring being spaced-apart from said outer sheath to form a low field region therebetween, said particle trapping ring having first and second longitudinal ends;
a pair of dielectric members one of which is secured to said trapping ring first longitudinal end and the other of which is secured to said trapping ring second longitudinal end, both of said dielectric members extending longitudinally outwardly from said trapping ring and radially outwardly towards said outer sheath; and
a support sheet secured to said trapping ring and disposed on said outer sheath within said low field region, said support sheet having an adhesive coating thereon on the sheet surface facing said trapping ring.

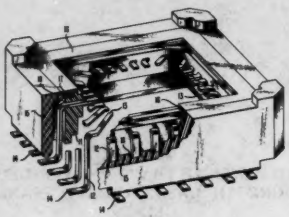
10. A method for conditioning a gas-insulated transmission line of the type including a cylindrical outer sheath at low potential, an inner conductor insulatably supported within said outer sheath, and a plurality of spaced low field regions within said outer sheath each having an adhesive disposed therein, comprising the steps of:
applying an AC voltage to said inner conductor in a plurality of voltage-time steps, said voltage-time steps increasing in voltage magnitude while decreasing in time duration.

4,330,683

ENCAPSULATION FOR SEMICONDUCTOR DEVICE

Frederick D. Parker, Basking Ridge, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Dec. 3, 1980, Ser. No. 212,564
Int. Cl.³ H05K 5/02
U.S. Cl. 174—52 FP 2 Claims



1. A semiconductor encapsulation of the chip carrier type having an array of close-spaced external metal lead members disposed in parallel relation around the periphery thereof,

characterized in that

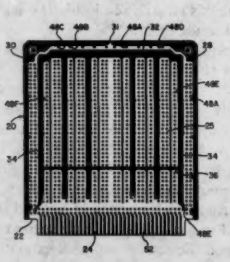
a collar-like protective housing member encompasses the periphery of the carrier and the external lead members, and has a mating surface which contacts a portion of the surface of the carrier, said mating surface comprising an inwardly projecting flange, the interior periphery of said flange defining with a portion of the surface of the carrier an annular slot, and which has a T-section key member bonded in said slot.

4,330,684

MATRIX BOARD

C. Michael Hayward, 23 Jacob Gates Rd., Harvard, Mass. 01451

Continuation-in-part of Ser. No. 864,457, Dec. 27, 1977, abandoned. This application Aug. 7, 1979, Ser. No. 64,372
Int. Cl.³ H05K 1/02
U.S. Cl. 174—68.5 7 Claims



1. A matrix circuit board comprising an insulating mounting board, said board having a first flat surface, a second flat surface, and a plurality of parallel columns of metallically plated-through first apertures extending through said board between said first and second surfaces, the majority of said first apertures in each said column being spaced approximately 0.10 inch on center from each other, the center lines of adjacent said columns being spaced from one another, each said spacing being one of a plurality of multiples n of 0.10 inch, n including each of the integers 1, 2, and 3;

first and second pluralities of electrical conductors physically mounted on one of said board surfaces, and third and fourth pluralities of electrical conductors fixedly mounted to the other of said board surfaces, said electrical conductors in each plurality being electrically discrete from the conductors of the other pluralities;

at least some of the conductors of said first and third pluralities extending between said columns on corresponding surfaces of said board where such columns are so spaced apart that $n \geqq 2$, and at least some of said second and fourth pluralities being distributed adjacent the periphery on corresponding surfaces of said board;

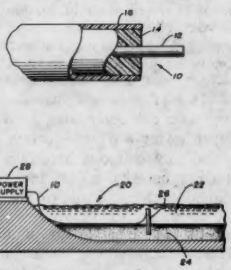
the plating of selected ones of said first apertures being electrically connected to selected ones of said conductors, the plating of the majority of said first apertures being electrically discrete from one another and from said conductors.

4,330,685

INSULATED WIRE HAVING A CONTROLLED SPECIFIC GRAVITY

Roy H. Bleikamp, Jr., Chesterfield, Mo., assignor to Monsanto Company, St. Louis, Mo.

Filed Sep. 8, 1980, Ser. No. 184,705
Int. Cl.³ H01B 7/12
U.S. Cl. 174—101.5 3 Claims



1. An insulated wire having a controlled specific gravity which will float on the interface between two immiscible fluids having different specific gravities comprising:

an electrical conductor,

a layer of a closed cell foam surrounding said electrical conductor, said layer of closed cell foam electrically insulating said electrical conductor and having a controlled density and outer diameter such that the specific gravity of said insulated wire is greater than the specific gravity of the upper immiscible fluid and is less than the specific gravity of the lower immiscible fluid, and

a sheath surrounding said layer of a closed cell foam, whereby said insulated wire will float on the interface between said upper and lower immiscible fluids.

4,330,686

LOUDSPEAKER SYSTEMS

Stephen Roe, Meadow Rd., Worthing, W. Sx BN11 2BT, England

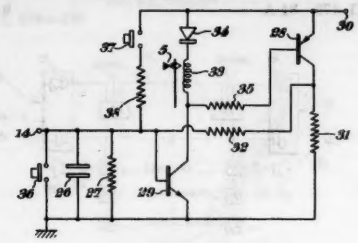
Filed Dec. 12, 1979, Ser. No. 102,786
Claims priority, application United Kingdom, Dec. 21, 1978, 49596/78
Int. Cl.³ H02H 7/20, 3/10
U.S. Cl. 179—1 A 10 Claims

1. A loudspeaker protection circuit for use with a loudspeaker having a voice coil and a voice coil drive circuit comprising:

an electromagnetic relay having a normally-closed contact, said normally closed contact adapted to be connected in the drive circuit of said voice coil; and

bistable means responsive to at least one of the voltage across and the current through said voice coil, said bistable means having reset and set states wherein said bistable

means is nonconductive when in the reset state and conductive when in the set state, said bistable means adapted to be changed from said reset to said set state when at least one of said voltage across and said current through said voice coil exceeds a predetermined level wherein said



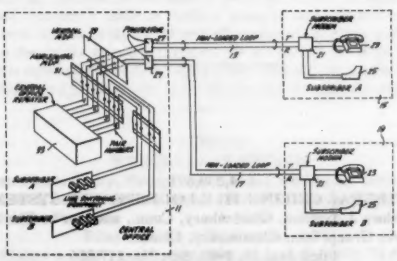
bistable means controls said electromagnetic relay so that said electromagnetic relay is energized when said bistable means is set and wherein the current drawn by the bistable means when in a reset state is less than the current drawn when the bistable means is in the set state.

4,330,687

AUDIO AND FULL DUPLEX DIGITAL DATA CARRIER SYSTEM

John D. Foulkes, Kirkland; David K. Worthington, Bellevue, both of Wash., and John E. Trombly, Winchester, Mass., assignors to Teltone Corporation, Kirkland, Wash.

Filed Mar. 14, 1979, Ser. No. 20,252
Int. Cl.³ H04M *11/06*; H04H *1/08*
U.S. Cl. 179—2 DP **48 Claims**



13. A subscriber data carrier system for the simultaneous bidirectional digital data communication between a pair of subscribers and voice communication between the subscribers or the subscribers and others all on a single pair of nonloaded wires connecting the subscribers' premises to the central office of a telephone system, said subscriber data carrier system comprising:

(A) first and second subscriber subsystems, one of said subscriber subsystems being located on the premises of one of said subscribers and the other of said subscriber subsystems being located on the premises of the other of said subscribers, each of said subscriber subsystems comprising:

(1) a data terminal for producing and receiving digital data in binary form; and,

(2) modem means connected between said data terminal and the subscribers' end of a pair of nonloaded wires connecting said subscriber's premises to said central office, each of said modem means including:

(a) a transmitter, said transmitter including a frequency synthesizer for converting digital data produced by said data terminal from binary signal form into FSK signal form such that a binary zero (0) causes said FSK signal to have a first frequency, F1, and a binary one (1) causes said FSK signal to have a second frequency, F2, F1 and F2 lying above the voice frequency band, said frequency synthesizer producing said F1 and F2 FSK signals in a manner that maintains phase coherency during shifts between said F1 and F2 FSK signals and in a manner such that the waveforms of said F1 and F2 FSK signals are substantially free of harmonics at third and fourth frequencies, F3 and F4, F3 and F4 also lying above the voice frequency band; and,

(b) a receiver, said receiver including a frequency detector for detecting an FSK signal at said third frequency, F3, and an FSK signal at said fourth frequency, F4, and converting digital data from FSK signal form into binary signal form such that an FSK signal at said third frequency, F3, causes a binary zero (0) and an FSK signal at said fourth frequency, F4, causes a binary one (1) and applying said binary digital data to said data terminal; and,

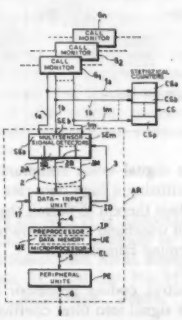
(B) a repeater connected to the central office end of the pairs of nonloaded wires connecting said subscribers to said central office, said repeater including conversion means for simultaneously converting F1 and F2 FSK signals produced by either of said subscribers into F3 and F4 FSK signals and fowarding said F3 and F4 FSK signals to the other subscriber.

4,330,688

SYSTEM FOR STATISTICAL SUPERVISION OF TRUNK-DIALED LONG-DISTANCE TELEPHONE CALLS

Paolo Tiribelli, Turin, Italy, assignor to CSELT - Centro Studi e Laboratori Telecomunicazioni S.p.A., Turin, Italy

Continuation-in-part of Ser. No. 916,355, Jun. 16, 1978, abandoned. This application Jan. 24, 1980, Ser. No. 115,034
Claims priority, application Italy, Jun. 21, 1977, 68436 A/77
Int. Cl.³ H04M *3/36*
U.S. Cl. 179—8 A **10 Claims**



1. An apparatus for supervising the activities of numerous communication circuits of a telephone system as determined by respective call monitors, comprising:

a plurality of signal detectors each including a multiplicity of sensors forming groups connected to respective call monitors for receiving output signals therefrom which are indicative of the state of energization of the supervised circuits, said signal detectors emitting individual output frames sequentially combining a predetermined number of bits derived from samples of the output signals received by the respective sensors;

a data-input unit including serializing means connected to said signal detectors for receiving said individual output frames thereof and synthesizing therefrom a comprehensive frame with a constant number of time slots accommodating a multiple of said predetermined number of bits,

said unit further including timing means for establishing a recurrent scanning cycle divided into several subcycles, said serializing means including switching means controlled by said timing means for selecting different combinations of output frames for assembly in said comprehensive frame during different subcycles, certain of said output frames derived from circuits in need of more frequent sampling being included in a plurality of subcycles periodically recurring within a scanning cycle; and

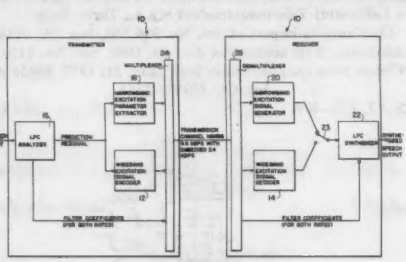
processing means connected to said unit for receiving said comprehensive frame in each scanning cycle and evaluating the bits contained in respective time slots thereof.

4,330,689

MULTIRATE DIGITAL VOICE COMMUNICATION PROCESSOR

George S. Kang, Silver Spring; Lawrence J. Fransen, Churchton, both of Md., and Evans L. Kline, Springfield, Va., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jan. 28, 1980, Ser. No. 115,860
Int. Cl.³ G10L *1/00*
U.S. Cl. 179—15.55 R **15 Claims**



1. A multirate digital voice communication processor for generating and utilizing a high data-rate digital signal with a low data-rate subset therein to permit the direct processing of this signal at both wideband and narrowband processors without analog tandeming comprising:

a speech input;

a linear predictive coding processor for decomposing an input speech signal into filter coefficient components and a prediction residual component;

a narrowband excitation parameter extractor for representing said prediction residual component by a low data-rate digital signal;

a wideband excitation signal encoder for representing said prediction residual component by a high data-rate digital signal;

means for multiplexing into a data stream and transmitting said filter coefficient components, said narrowband low data-rate digital signal, and said wideband high data-rate digital signal;

means for receiving a transmitted encoded signal and demultiplexing said filter coefficient components and said low and high data-rate digital signals therefrom; and

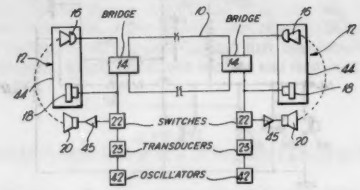
means for decoding said demultiplexed encoded signals and reconstructing an approximation of the original speech prior to encoding.

4,330,690

TELEPHONE GROUP LISTENING SYSTEMS

Radamis Botros, Nepean, Canada, assignor to Northern Telecom Limited, Montreal, Canada

Filed May 5, 1980, Ser. No. 150,434
Int. Cl.³ H04M *1/60, 1/20*
U.S. Cl. 179—81 A **9 Claims**



1. Telephone apparatus comprising:

a handset housing a microphone transmitter;

a base set housing a loudspeaker;

a transmission bridge for transmitting an output of the microphone transmitter to a telephone line and for transmitting an input from said telephone line to the loudspeaker;

a switch between said transmission bridge and the loudspeaker for controlling input to the loudspeaker;

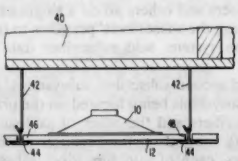
and transducer means within the handset operable to actuate said switch when said handset enters and exits a preset positional range relative to the base set, whereby to inhibit input to the loudspeaker when the handset is within said preset range but to pass the input to the loudspeaker when the handset is outside said preset range.

4,330,691

INTEGRAL CEILING TILE-LOUDSPEAKER SYSTEM

Theodore J. Gordon, Glastonbury, Conn., assignor to The Futures Group, Inc., Glastonbury, Conn.

Filed Jan. 31, 1980, Ser. No. 117,056
Int. Cl.³ H04R *3/12, 27/00*
U.S. Cl. 179—146 E **15 Claims**



15. A loudspeaker assembly comprising a rectangular tile having at least two edges and an outer surface, a loudspeaker including an active transducing element, said loudspeaker being supported by said tile, said tile member being constructed and arranged to permit sound from said transducer and loudspeaker to emanate from said outer surface, and electrical connection means disposed on at least one of said edges for energization of said transducer, said edges of said tile being the support for said loudspeaker assembly.

4,330,692

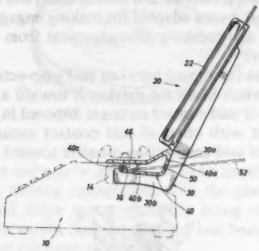
TELEPHONE ATTACHMENT FOR SUPPORTING A BOOK OR THE LIKE ABOVE THE TELEPHONE

Thomas V. Foreman, Sr., 17706 Carelia La., Spring, Tex. 77379

Continuation-in-part of Ser. No. 61,908, Aug. 1, 1979, abandoned. This application Dec. 6, 1979, Ser. No. 97,142

Int. Cl.³ H04M *1/21*

U.S. Cl. 179—178 18 Claims



1. An attachment for a telephone such as a standard desk telephone having a lifting cavity to receive the fingers of the lifting hand with an anti-slip ridge across the upper wall of the cavity, said attachment comprising an easel-like member for supporting a book or the like above the telephone, means connected to the easel-like member for engaging the telephone to support the easel-like member in the desired position, and a hook member having one end connected to the attachment and one end formed as a hook for extending into the cavity to engage the inner side of the anti-slip ridge in the upper wall of the lifting cavity of a telephone to hold the supporting means in position in engagement with the telephone to support the easel-like member in the desired position, further in which the hook member is made of resilient material and is positioned to be bent downwardly by the anti-slip ridge as the hook is moved into the cavity to cause the hook on the end of the member to move upwardly into firm engagement with the inner side of the anti-slip ridge when the hook has passed the anti-slip ridge.

4,330,693

MULTI-POLAR SWITCH

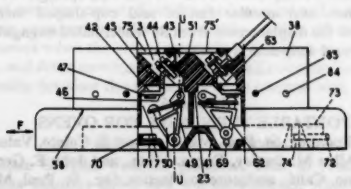
Jean-Pierre Guery, Poissy, and Bernard Roblin, La Celle Saint Cloud, both of France, assignors to La Telemecanique Electrique, France

Filed Jan. 19, 1979, Ser. No. 4,774

Claims priority, application France, Jan. 19, 1978, 78 02106

Int. Cl.³ H01H *15/00*

U.S. Cl. 200—1 R 5 Claims



1. A multipolar switch comprising:

a—an elongated insulating body having upper and lower faces and first and second side faces, the said first and second side faces being parallel to the longitudinal direction of said insulating body; the said insulating body having a lower recessed portion opening into the said lower face; the said insulating body further having an intermediate portion, a plurality of partitions in said intermediate portion defining a plurality of transverse channels opening along the first and second side faces and communicating with said recessed portion, each channel having first and second bearing surfaces located in the same plane which is substantially parallel to the said upper and lower faces, the said insulating body further having an upper portion, with a longitudinal insulating partition in said upper portion, said longitudinal partition being parallel to said first and second side faces and substantially equidistant therefrom; said upper portion having, above each of said channels, a pair of recesses opening along the said upper face and along the respective first and second side faces, the two recesses of each pair being separated by the said insulating partition and opening into the respective channel;

b—a plurality of pairs of connecting means, each connecting means comprising a terminal housed in the respective recess of said upper portion, a fixed contact housed in the respective channel and a conductive coupling member connecting the said terminal to the said fixed contact, said fixed contact having a pressure surface which engages a respective first bearing surface of the channel;

c—a plurality of moving contact carriers respectively housed in said channels, each of said contact carriers comprising a contact bridge mounted for engagement with the fixed contacts of the respective pair, said contact carrier further having coupling means;

d—an elongated operating member housing in the lower recessed portion and having a plurality of coupling surface portions in engagement with the respective coupling means of the said contact carriers, said operating member being movable from a first to a second position along said lower recessed portion in a direction of motion substantially parallel to the said upper and lower faces and to said first and second side faces and

e—a cover having a top portion covering the said upper face and two first and second parallel side walls, covering the respective side faces of the said insulating body at least in the upper and intermediate portions thereof, said top portion having a plurality of openings respectively located facing the said terminals, said first and second side walls being respectively provided with first and second pluralities of further openings, each first further opening and a corresponding second further opening having an common axis of symmetry at right angles with and in close proximity to a respective second bearing surface of the channel, each of said moving contact carriers having means for pivotally mounting it about the said common axis of symmetry.

4,330,694

COMPLEX SWITCH ASSEMBLY

Akira Ogawa, Iwakura, Japan, assignor to Kabushiki Kaisha Tokai Rika Denki Seisakusho, Aichi, Japan

Filed Jan. 31, 1980, Ser. No. 117,305

Claims priority, application Japan, Nov. 5, 1979, 54/153339[U]

Int. Cl.³ H01H *25/04*

U.S. Cl. 200—6 A 10 Claims

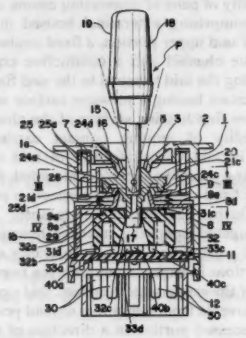
1. A complex switch assembly comprising:

(a) a casing having a hollow interior and having a first opening defined in one end thereof;

(b) a supporting member having a second opening at the center thereof, said supporting member being rigidly mounted in the interior of said casing and spaced from said one end with said first and second openings in alignment with each other;

(c) an operating lever constituted by a sphere, a bar portion extending radially outwardly from the sphere and a leg portion extending radially outwardly from the sphere in a direction opposite to said bar portion, said sphere having a diameter larger than the size of both of said first and second openings, said sphere being rotatably held in position between said one end and said support member with

portions protruding into the first and second openings and said bar portion extending outwardly from said casing through said first opening and said leg portion extending through said second opening, said operating lever, when it is located with said bar portion and said leg portion in alignment with an imaginary line extending between the centers of the first and second openings, being rotatable about the longitudinal axis of said bar portion between a plurality of different neutral positions at different rotational positions of said operating lever around said longitudinal axis, and said operating lever also being tiltable about the center of the sphere in a plurality of directions when the operating lever is in any one of the neutral positions;



(d) contact means fixedly mounted in said casing and having a plurality of pairs of contact portions for being connected to complete circuits to be controlled by said switch assembly; and

(e) contactor means being mounted in said casing for shifting movement laterally across said contact means for shifting said contactor means into and out of contact with said pairs of contact portions and for rotational movement substantially around said line as an axis, said leg portion and said contactor means being connected for moving said contactor means in rotational movement upon rotation of the operating lever around said line and for shifting said contactor means laterally upon tilting of said operating lever.

4,330,695

CONTROL DEVICE

Ronald W. Poling, Morrison, Ill., assignor to General Electric Company, Fort Wayne, Ind.

Filed Feb. 27, 1980, Ser. No. 125,122
Int. Cl.³ H01H *35/34*
U.S. Cl. 200—83 P **19 Claims**

1. A control device comprising:

a pair of housing members secured together against displacement;

a diaphragm interposed between said housing members and defining with said housing members a pair of chambers therein;

a control port in one of said housing members adapted for subjection to fluid pressure and communicated with one of said chambers;

a snap-action member operable between a stable configuration and an unstable configuration and including a circumferential portion seated at least in part on the other of said housing members within the other of said chambers, a central portion integral with said circumferential portion and spanning at least in part across said other chamber, and a center point of said snap-action member within said central portion;

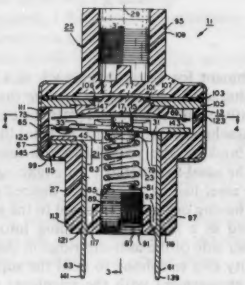
a spacer arranged in abutment between said diaphragm and said snap-action member and operable generally for effecting the operation of said snap-action member toward its unstable configuration when the control fluid pressure at said control port and acting on said diaphragm attains a preselected value;

a pair of terminal means mounted in said other housing member and extending in part exteriorly of said other housing member;

a resilient switch blade connected with one of said terminal means within said other chamber;

a pair of contact means on said switch blade and the other of said terminal means adapted for making engagement with each other and breaking disengagement from each other, respectively,

actuator means interposed between said snap-action member and said switch blade for driving it toward a position in which one of said contact means is disposed in the making engagement with other of said contact means upon the operation of said snap-action member toward its unstable



configuration, said actuator means including a generally cup-shaped member having a generally annular rim arranged in wheel-based engagement with said snap-action member so as to extend generally about a part of said central portion of said snap-action member in radial spaced relation with said center point;

a coil spring having one of a pair of opposite ends thereof biased into engagement with said actuator means and with the compressive force of said coil spring acting to maintain said annular rim of said cup-shaped member against displacement from its wheel-based engagement with said snap-action member; and

an adjusting screw threadedly engaged with said other housing member and disposed in abutment with the other opposite end of said coil spring, said adjusting screw being threadedly movable in said other housing member to adjust the compressive force of said coil spring acting to maintain said annular rim of said cup-shaped member against the displacement from its wheel-based engagement with said snap-action member.

4,330,696

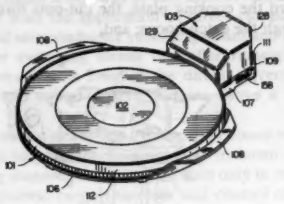
PORTABLE TURNTABLE FOR OVENS

James F. Pomeroy, St. Paul, Minn.; Albert E. Colato, Valencia, Calif.; Allen M. Danley, Eagan, Minn., and John E. Gerling, Cupertino, Calif., assignors to Plastics, Inc., St. Paul, Minn.

Continuation-in-part of Ser. No. 897,048, Apr. 17, 1978, abandoned. This application Mar. 18, 1980, Ser. No. 131,505
Int. Cl.³ H05B *6/80*; A47B *11/00*
U.S. Cl. 219—10.55 F **33 Claims**

1. A portable turntable for use in the cooking cavity of a microwave oven, comprising a generally planar base which rests on the floor of the oven cavity, a generally planar platform including a ring of gear teeth rotatively mounted on the base in close proximity to the floor of the oven cavity with no drive mechanism beneath either the platform or the base, and

a drive motor assembly mounted on the upper side of the base to one side of the platform for rotatively driving the platform, said drive motor assembly including an enclosure which is reflective to microwave energy, an output shaft extending through a microwave attenuating passageway in one wall of



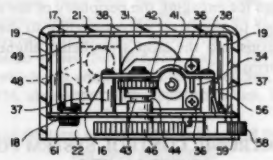
the enclosure and a drive gear mounted on the shaft outside the enclosure in driving engagement with the gear teeth on the platform, said drive motor assembly being of substantially smaller lateral extent than the platform and being positioned in one corner of the oven cavity.

4,330,697

DRIVE MOTOR ASSEMBLY FOR USE IN A MICROWAVE OVEN

Allen M. Danley, Eagan, Minn., and Albert E. Colato, Valencia, Calif., assignors to Plastics, Inc., St. Paul, Minn.

Filed Mar. 18, 1980, Ser. No. 131,507
Int. Cl.³ H05B *9/06*
U.S. Cl. 219—10.55 F **12 Claims**



1. A self-contained drive motor assembly for use interchangeably with different appliances in a microwave oven, comprising a housing reflective to microwave energy defining a microwave-tight enclosure substantially smaller than the oven cavity so that it will not interfere appreciably with the distribution of microwave energy in the cavity when placed therein, a drive motor enclosed within the housing, an output shaft driven by the motor and extending through a microwave attenuating passageway in one wall of the housing, and an output member mounted on the shaft outside and housing for driving engagement with a moveable portion of one of the appliances when the motor assembly is mounted on said appliance, said drive motor assembly being self-contained and freely moveable between the appliances as an integral unit.

4,330,698

MICROWAVE MELTER

Yoshihisa Sawada; Fumiaki Komatsu, both of Nishinomiya; Kazuo Sanada, Kobe, and Yorihisa Sakaki, Akashi, all of Japan, assignors to Doryokuro Kakunenryo Kaihatsu Jigyodan, Tokyo, Japan

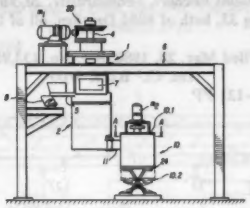
Filed Apr. 21, 1980, Ser. No. 141,905
Claims priority, application Japan, Apr. 21, 1979, 54-49599
Int. Cl.³ H05B *6/80*
U.S. Cl. 219—10.55 A **6 Claims**

1. A microwave melter of the type in which material charged in a crucible of a furnace is heated and melted by irradiation of microwaves from a microwave oscillator, said melter comprising:

a waveguide connected to said microwave oscillator for guiding microwaves toward the furnace;

an upper furnace body connected to said waveguide;

a lower furnace body detachably connected to said upper furnace body;



a rotatable container provided in said lower furnace body and adapted to rotate said crucible in a suspended state;

a feed pipe for feeding untreated material to said crucible; and

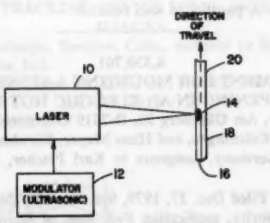
a tuner mounted on top of said upper furnace body for tuning said microwaves.

4,330,699

LASER/ULTRASONIC WELDING TECHNIQUE

Michael M. Farrow, Boulder, Colo., assignor to The United States of Amer[illegible] as represented by the Secretary of the Navy, Washington, D.C.

Filed Jul. 27, 1979, Ser. No. 61,350
Int. Cl.³ B23K *26/00*
U.S. Cl. 219—121 LD **12 Claims**



1. An improved method for non-contact laser welding having the step of heating a weld joint with a high powered laser to form a melt, the improvement comprising the step of inducing ultrasonic waves in said melt to aid in the interdiffusion of said melt and the homogeneity of said weld joint wherein said inducing step comprises amplitude modulating at an ultrasonic frequency the output of said high powered laser to generate said ultrasonic waves.

11. A non-contact laser welding system comprising:

(a) a high powered laser for heating a weld joint to form a melt;

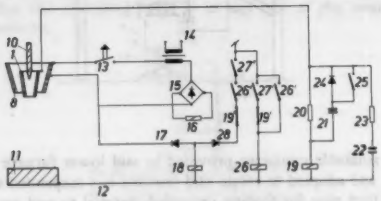
(b) means for inducing ultrasonic waves in said melt to aid the interdiffusion of said melt and the homogeneity of said weld joint; wherein

(c) said inducing means comprises a second laser focused on said melt; and means for amplitude modulating at an ultrasonic frequency the output of said second laser to generate said ultrasonic waves.

4,330,700
PLASMA BURNER WITH CONTACT PROTECTION

Peter Jagieniak, R. Harbig Str. 24, 798 Finsterwalde; Hans Koerdt, Hauptstr. 164, 7971 Schönborn; Jochen Böhme, Tauschenstr. 38; Dieter Odrich, Libenauer Str. 25, both of 8021 Dresden; Rudolf Pochert, Leonhardistr. 20, and Peter Wiese, Veilchenweg 32, both of 8054 Dresden, all of German Democratic Rep.

Filed Mar. 25, 1980, Ser. No. 133,957
Int. Cl.³ B23K 9/00
U.S. Cl. 219—121 PP 5 Claims



1. A plasma burner with a contact protection device comprising;

a nozzle having concentrically therein, a cathode;

a nozzle cap around said nozzle with a space therebetween for cooling water flow;

an electrically conductive protective cap around said nozzle cap electrically spaced therefrom by an air space, said protective cap electrically connected to a fault clearing circuit;

a voltage indicator connected between a workpiece and said nozzle which functions as a switching device supervising the voltage potentials therebetween;

wherein said electrically conductive protective cap is fastened electrically insulated on the shaft of the plasma burner by at least two contact pieces, each of which is connected by a line to the protective fault clearing circuit connection and, in in said circuit, a resistor in series to said voltage indicator, at least one capacitor having a diode in series is in parallel to said resistor.

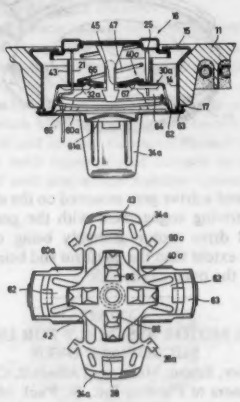
4,330,701
ARRANGEMENT FOR MOUNTING A SENSING BOX IN AN OPENING IN AN ELECTRIC HOT PLATE

Karl Fischer, Am Gänsberg 23, D-7519 Oberderdingen; Robert Kicherer, Knittlingen, and Hans Mayer, Kürnbach, all of Fed. Rep. of Germany, assignors to Karl Fischer, Fed. Rep. of Germany

Filed Dec. 27, 1979, Ser. No. 107,756
Claims priority, application Fed. Rep. of Germany, Jan. 2, 1979, 2900051
Int. Cl.³ H05B 3/68
U.S. Cl. 219—450 11 Claims

1. In an arrangement for mounting a temperature sensing box in an opening in an electric cooking plate, through which opening the sensing box may engage a cooking vessel standing on the plate, the sensing box being connected to control means by a capillary tube and being urged toward the cooking plate by a spring, the spring being supported by a holding member, the sensing box being axially movable to a limited extent relative to the holding member, the holding member having a catch hoop for positioning and locking the holding member in place and a spreader for limiting movement of the sensing box toward the catch hoop, the improvement wherein the holding member comprises:

a first sheet metal member, forming the catch hoop, in the form of a star having a substantially flat central portion and four support arms, formed by cut-outs, two of the arms bent away from the sensing box and having oppositely acting catch elements for interengaging corresponding structure of the cooking plate, preventing movement both toward and away from the cooking plate, and the other two of the arms being flat in the vicinity of the corresponding structure of the cooking plate except for outwardly directed bent portions which can abut the bottom of, but cannot interengage the corresponding structure of the cooking plate, only preventing movement toward the cooking plate, the cut-outs forming passages through the catch hoops; and,

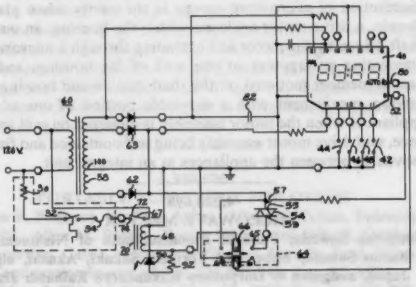


a plurality of sheet metal stop arms, fixed to the central portion of the first member and directed toward the sensing box, forming the spreader, the stop arms having abutment edges for engaging the periphery of the sensing box, the number of stop arms corresponding to the number of support arms and the stop arms being aligned with the support arms.

4,330,702
ELECTRONIC CONTROL SYSTEM FOR COFFEEMAKER

Chung-Kae C. Cheng, Hamden, Conn., assignor to General Electric Company, New York, N.Y.

Filed Oct. 20, 1980, Ser. No. 199,048
Int. Cl.³ H05B 1/02
U.S. Cl. 219—492 11 Claims



1. In a coffeemaker, improved heating and control means comprising:

(a) a power circuit for connection to a source of electric power, said power circuit comprising heating means and a first switching means having a normally non-conductive state and a conductive state;

(b) a control circuit for connection to a source to direct

current electric power, said control circuit comprising activating means and a semiconductor switching means having a normally non-conductive state and a conductive state, said semiconductor switching means having a control terminal and assuming its conductive state only when a turn on signal is supplied to said control terminal simultaneously with the application of direct current voltage across said semiconductor switching means and said semiconductor switching means thereafter remaining in its conductive state so long as the direct current flowing through said control circuit remains above a minimum level:

(c) said activating means being operatively connected to said first switching means to place and maintain said first switching means in its conductive state only in response to flow of electric current through said control circuit and said activating means; and

(d) means for supplying a turn-on signal to said control terminal of said semiconductor switching means when heating of the coffeemaker is desired, whereby subsequent removal of the turn-on signal from said control terminal has no effect on operation of said power circuit and said heating means so long as the direct current flowing through said control circuit remains above said minimum level.

4,330,703

LAYERED SELF-REGULATING HEATING ARTICLE

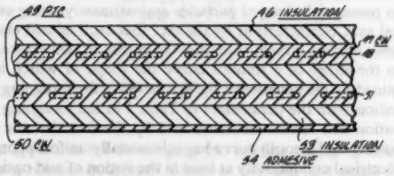
David A. Horsma, Palo Alto; Bernard J. Lyons, Atherton, and Robert Smith-Johannsen, Portola Valley, all of Calif., assignors to Raychem Corporation, Menlo Park, Calif.

Continuation of Ser. No. 601,638, Aug. 4, 1975, Pat. No. 4,177,376, which is a continuation-in-part of Ser. No. 510,036, Sep. 27, 1974, abandoned. This application Sep. 24, 1979, Ser. No. 78,386

The portion of the term of this patent subsequent to Dec. 4, 1996, has been disclaimed.

Int. Cl.³ H05B *3/12, 3/38*

U.S. Cl. 219—553 **51 Claims**



1. A self-regulating electrical heating article adapted for connection to a source of electrical power comprising a first layer of material, said first layer exhibiting a positive temperature coefficient of resistance with an associated anomaly temperature T_s and having at least partially contiguous therewith a second layer of constant wattage material having an associated resistance, said article being connectable to an electric power input source whereby current flow is through at least a portion of said first layer and through at least a portion of said second layer, whereby there is both direct electrical and thermal coupling between said first and second layers, and whereby at a temperature which is the higher of the temperature at which the resistance of said first layer exceeds the resistance of said second layer or the anomaly temperature of said first layer, current flow predominantly follows the directionally shortest path through said first layer.

4,330,704

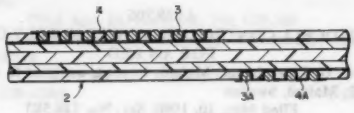
ELECTRICAL DEVICES COMPRISING CONDUCTIVE POLYMERS

Michael L. Jensen, Mountain View, Calif., assignor to Raychem Corporation, Menlo Park, Calif.

Filed Aug. 8, 1980, Ser. No. 176,300

Int. Cl.³ H05B *3/10*

U.S. Cl. 219—553 **27 Claims**



1. An electrical device which comprises a conductive polymer element and a laminar electrode in physical contact with the conductive polymer element, said electrode having secured thereto an electrical connection means comprising

(1) a laminar, self-supporting conductive member having apertures therein;

(2) a filamentous member which comprises a plurality of conductive filaments, at least some of the conductive filaments physically contacting the electrode and being deformed from their natural configuration to conform at least partially with the surface of the electrode, at least some of the conductive filaments physically contacting the laminar conductive member and being deformed from their natural configuration to conform at least partially with the surface of the laminar conductive member, and at least some of the conductive filaments lying between and electrically connecting the electrode and the laminar conductive member; and

(3) a bonding material which bonds to each other the electrode, the laminar conductive member and at least some of the conductive filaments.

4,330,705

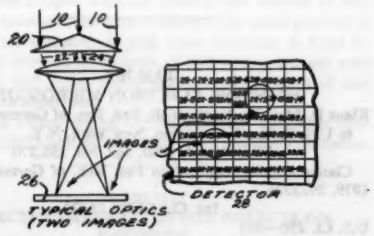
OPTICAL TRACKING DEVICE USING INTERLACED IMAGES

Jerome C. Kollodge, Boulder, Colo., assignor to Ball Corporation, Muncie, Ind.

Filed Jan. 15, 1980, Ser. No. 112,806

Int. Cl.³ G01J *1/20*

U.S. Cl. 250—203 R **19 Claims**



1. A method for defining the position of a light-emitting object comprising the steps of:

splitting the beam of light from the light emitting object to form at least two beams of light;

focusing the two beams of light onto an array of light sensitive elements each light sensitive element generating an electrical signal related the amount of light focused thereon;

generating a first beam signal from a first subset of the light sensitive elements;

generating a second beam signal from a second subset of the light sensitive elements; and

combining the first and second beam signals to form a composite signal representing the position of the light-emitting object.

4,330,706

PHOTOCELL CONTROLLED POWER SUPPLY CIRCUIT FOR AN LED

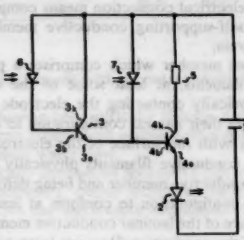
Carl S. G. Lawenhaupt, Malmö, Sweden, assignor to Aimpoint AB, Malmö, Sweden

Filed Mar. 10, 1980, Ser. No. 128,583

Claims priority, application Sweden, Mar. 12, 1979, 7902192

Int. Cl.[3] H01J *40/14*

U.S. Cl. 250—214 AL 1 Claim



1. A power supply circuit for controlling emission of a light emitting diode in dependence upon ambient light comprising in combination,

said light emitting diode,

a pair of transistors arranged in a darlington connection with a base input an emitter output connected to drive said light emitting diode and an emitter to base connection between the transistors,

a power source having a first of two terminals connected to the darlington pair through said light emitting diode,

and a pair of photo responsive diodes, one connecting said base to the second power source terminal and the other connecting the emitter to base connection between the transistors to the second power source terminal.

4,330,707

SCANNING ELECTRON MICROSCOPE

Klaus D. Manzke, Norderstedt, Fed. Rep. of Germany, assignor to U.S. Philips Corporation, New York, N.Y.

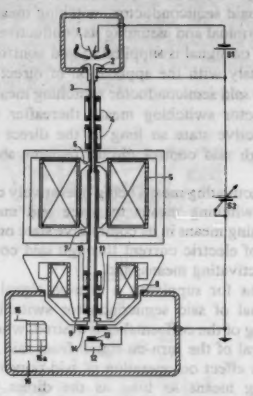
Filed Jun. 2, 1980, Ser. No. 155,270

Claims priority, application Fed. Rep. of Germany, Jun. 1, 1979, 2922325

Int. Cl.[3] G01N *23/00*

U.S. Cl. 250—311 7 Claims

1. A scanning electron microscope comprising an electron gun including a cathode for generating electrons, an anode for accelerating electrons, an electron-optical column for guiding electrons, a specimen holder for accommodating and positioning a specimen to be examined, a brake electrode arranged between said electron-optical column and said specimen, means for applying a first voltage between said cathode and said anode to accelerate electrons, means for applying a second adjustable voltage between said anode and said brake electrode, said second voltage being of reverse polarity with respect to said first voltage, and said second voltage being adjusted in accordance with the kind of specimen to be examined, a detector for detecting electrons emerging from said specimen, and a display device for displaying an image of said specimen.



4,330,708

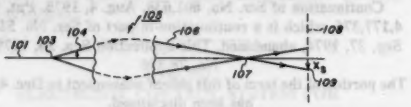
ELECTRON LENS

William D. Meisburger, 1731-B Marshall Ct., Los Altos, Calif. 94022

Filed Apr. 28, 1980, Ser. No. 144,596

Int. Cl.[3] G21K *1/08;* H01J *29/46*

U.S. Cl. 250—396 ML 18 Claims



1. A charged particle lens comprising two electrodes aligned with each other on an optical axis, a portion of each electrode in the region of said optical axis being substantially transparent to passage of charged particles approximately along said optical axis, characterized by the fact that each of said electrodes has a surface which, at least in the region of said optical axis, is in the shape of a smooth curve the shape of which is determined by the equations (7), (8), and (9) in the foregoing specification with the parameters in Table I in the foregoing specification and further characterized by the fact that the surface having said smooth curve has substantially uniform continuous electrical conductivity at least in the region of said optical axis.

4,330,709

ELECTRONIC OPTICAL OBJECTIVE

Emmanuel de Chambost, Paris, France, assignor to Thomson-CSF, Paris, France

Continuation of Ser. No. 973,950, Dec. 28, 1978, abandoned.

This application May 30, 1980, Ser. No. 154,911

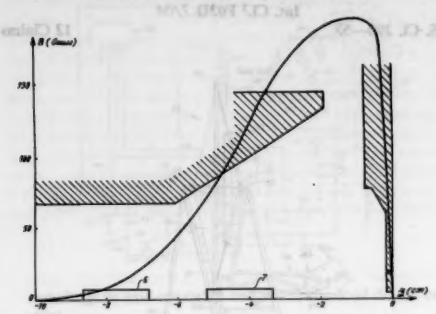
Claims priority, application France, Jan. 3, 1978, 78 00049

Int. Cl.[3] G21K *1/08*

U.S. Cl. 250—396 ML 4 Claims

1. An electronic optical objective comprising a magnetic lens of revolution for receiving an electron beam along its optical axis, said lens being capable of forming on said optical axis an axial magnetic field which varies from its input pupil to its output pupil, and at least one deflector for creating a magnetic field of variable intensity in order to deflect the electron beam in a given direction, said at least one deflector compris-

ing two magnetic coil systems placed respectively close to the input pupil and close to the output pupil, the two coil systems being identical and made up of four coils in quadrature, the



coils in each system being angularly offset from the corresponding coil in the other system by a certain angle θ, other than 90°, said lens including polepieces comprising an element of soft iron and an element of ferrite spaced apart by an airgap.

4,330,710

APPARATUS AND METHOD FOR THE DOSIMETRY OF NEUTRONS

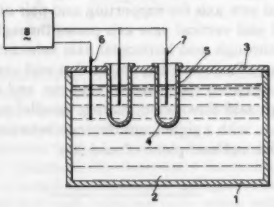
Luigi Tommasino, Rome, and Giorgio Zapparoli, Anguillara, both of Italy, assignors to Comitato Nazionale per l'Energia Nucleare-CNEN, Rome, Italy

Filed May 16, 1978, Ser. No. 906,598

Claims priority, application Italy, May 20, 1977, 49495 A/77

Int. Cl.[2] G01T *5/00, 3/00*

U.S. Cl. 250—472 **14 Claims**



1. An apparatus for developing the nuclear tracks by neutrons in a tubular dosimeter closed at one end and made of transparent non-pierced dielectric material by means of an electrolyte capable of chemically attacking said material by means of a non-constant high voltage applied to said electrolyte, which apparatus comprises:

a liquid tight tank filled with electrically conducting liquid and not attackable by said liquid nor by said electrolyte;

a holder in said tank for keeping said dosimeter upright and immersible in said liquid for a substantial section of its length, said dosimeter being filled with electrically conducting liquid; at least one of said electrically conducting liquids being an electrolyte capable of chemically attacking the dosimeter material;

an electrode immersed into the liquid within the tank;

an electrode positioned in said dosimeter; and

a generator of high voltage not constant in value connected respectively to the electrode of said tank and to the electrode of the dosimeter.

4,330,711

CONTAINER COMBINATION FOR THE TRANSPORTATION AND STORAGE OF RADIOACTIVE WASTE ESPECIALLY NUCLEAR REACTOR FUEL ELEMENTS

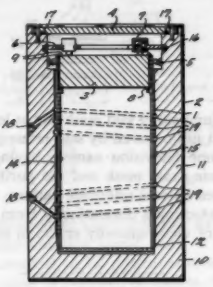
Stefan Ahner, In der Gartel 4, 6458 Rodenbach; Richard Christ, August-Bebel-Strasse 20, 6454 Bruchkobel; Dieter Klein, Heinrich-Heine-Strasse 9, 6360 Friedberg, and Peter Srostlik, Hahnenkammstrasse 2, 6457 Maintal 4, all of Fed. Rep. of Germany

Filed Apr. 14, 1980, Ser. No. 139,666

Claims priority, application Fed. Rep. of Germany, Apr. 14, 1979, 2915376

Int. Cl.[3] G21F *5/00*

U.S. Cl. 250—506 **7 Claims**



1. A container combination suitable for the transportation and storage of irradiated fuel elements of nuclear reactors comprising, in combination, a removable inner container which is usable by itself for storage in a correspondingly laid out fuel element storehouse and an outer container wherein the two containers each has its own cover, each said container having a bottom and said outer container having jacket means and wherein:

(a) the thickness of the bottom and the jacket means of the outer container are such that they serve as shielding against gamma and neutron radiation;

(b) said inner container is axially fixed in said outer container with the cover of the inner container spaced from and out of contact with the cover of said outer container;

(c) said outer container and jacket means have an interior wall which taper inwardly toward said bottom of said outer container to an extent whereby the radial position of said inner container in said outer container is fixed by contact between the exterior of said inner container with at least said jacket means adjacent said bottom of said outer container; and

(d) sealing means urging the outer wall of said inner container tightly against the inner wall of said outer container.

4,330,712

INSPECTION APPARATUS FOR DEFECTS ON PATTERNS

Hajime Yoshida, Tokyo, Japan, assignor to Hajime Industries Ltd., Tokyo, Japan

Filed Jan. 29, 1980, Ser. No. 116,450

Claims priority, application Japan, Feb. 1, 19/9, 54-11100; Feb. 1, 1979, 54-11101

Int. Cl.[3] G01N *21/88*

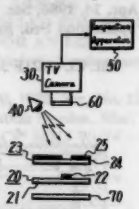
U.S. Cl. 250—572 **8 Claims**

1. Apparatus for inspecting an object having a pattern to be inspected on a base plate, said pattern to be inspected having a first colour and said base plate having a second different colour, comprising:

at least one mask including an opaque reference pattern on a transparent base plate;

said mask being positionable over said object with said reference pattern matched with one of said pattern to be inspected and portions of said base plate not covered by said pattern to be inspected and with the other thereof visible through portions of said transparent base plate not covered by said reference pattern;

said reference pattern having a colour the same as the portions of said object not covered by said reference pattern;



means for illuminating said mask and at least the portions of said object not covered by said reference pattern;

a monochrome television camera having a field of view encompassing said mask and the portions of said object not covered by said reference pattern; and

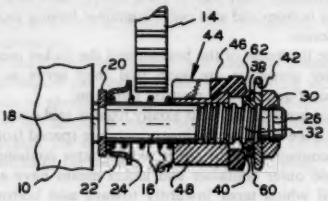
means for detecting a discontinuity from a single colour in said field of view whereby errors in said pattern are detected.

4,330,713

CUSHIONED STARTER PINION

Leon D. Greenwood, Eaton Rapids, Mich., assignor to Eaton Stamping Company, Eaton Rapids, Mich.

Filed Apr. 16, 1980, Ser. No. 140,844
Int. Cl.³ F02N 11/00
U.S. Cl. 290—48 **11 Claims**



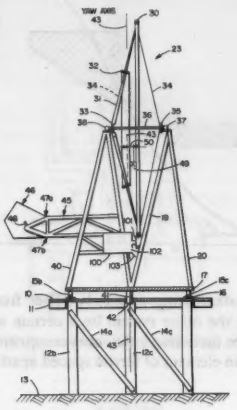
1. In an electric starter for internal combustion engines including an electric motor having a rotatable shaft having a screw thread defined thereon, a nut member threaded upon said shaft thread wherein relative rotation thereon axially translates said nut member on said shaft, a pinion gear member concentrically mounted on said shaft for rotational and axial movement thereon, a stop mounted on said shaft limiting movement of said gear member upon said shaft, the improvement comprising a variable compression characteristic resilient member formed of elastic resilient deformable material interposed between the nut member and pinion gear member establishing a frictional rotative drive between the nut member and gear member for rotating the gear member and variably cushioning the gear member relative to axial forces imposed thereon by the nut member whereby initial cushioning of axial forces is relatively soft and sequentially cushioning increases in stiffness, said resilient member being circumferentially unconfined to permit radial expansion of said resilient material thereof, and an axially extending projection defined upon one of said members axially extending toward the adjacent member causing limited radial displacement and deformation of said resilient member material during initial cushioning.

4,330,714

WIND TURBINE SYSTEM

Otto J. M. Smith, 612 Euclid Ave., Berkeley, Calif. 94708

Filed Jun. 26, 1980, Ser. No. 163,385
Int. Cl.³ F03D 7/04
U.S. Cl. 290—55 **12 Claims**



1. A wind turbine system comprising:

a turbine wheel with a substantially horizontal axle and including an exterior rim and airfoils mounted between said rim and said axle;

a pair of axle bearings for supporting said wheel for rotation when acted upon by the wind, said bearings lying on the opposite sides of the projection of said airfoils onto a plane through said axle, one of said axle bearings being designated the upwind bearing and the other of said axle bearings being designated the downwind bearing;

a rigid structure; and

a supporting base rotatable on said rigid structure around a vertical yaw axis for supporting said pair of axle bearings so that said vertical yaw axis passes through a horizontal plane through said horizontal axle substantially between said pair of axle bearings and so that said vertical yaw axis passes between the plane of said rim and another plane through said downwind bearing parallel to the plane of said rim, with a significant distance between said vertical yaw axis and said plane of said rim.

4,330,715

AUTOMATIC FEEDBACK SYSTEM

Lebern W. Stroud, 1018 Briarcliff, Arlington, Tex. 76012, and Jack E. Everett, 7216 Craig St., Ft. Worth, Tex. 76112

Filed Feb. 15, 1980, Ser. No. 121,989
Int. Cl.³ H02P 9/02, 9/14
U.S. Cl. 307—10 R **9 Claims**

1. A system coupled to a multi-phase rectified rotary field system to increase the power and current through feedback, said multi-phase system comprising a rotatable coil for forming said rotary field when excited, stationary windings, an output, and rectifier means coupled to said stationary windings and to said output, said system comprising:

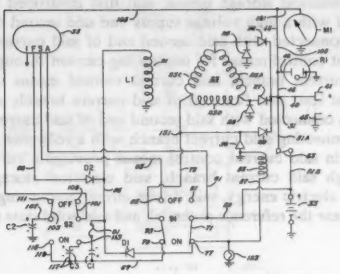
diode means,

a DC power supply for exciting said rotatable coil of said multi-phase system by way of said diode means,

output means coupled to said output for applying current to a load, and

capacitor means having one side coupled to said stationary

windings and an opposite side coupled to said rotatable coil for applying a pulsating output from said stationary



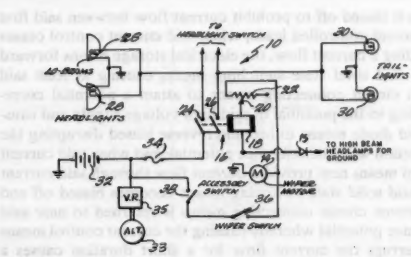
windings to said rotatable coil when the load draws current.

4,330,716

AUTOMATIC VEHICLE HEADLIGHT CONTROL SYSTEM

Bob Rust, 1073 Hampton Rd., Daytona Beach, Fla. 32014

Filed Sep. 23, 1980; Ser. No. 190,052
Int. Cl.³ H02J *1/00*
U.S. Cl. 307—10 LS **11 Claims**



9. An electrical control system for use in a vehicle having an engine, a voltage source connected to a windshield wiper motor by a wiper control switch, and vehicle headlights and taillights, said control system comprising:

means, responsive to the operation of said windshield wiper motor, for automatically electrically connecting said voltage source to said headlights and taillights to energize said headlights and said taillights only when said engine is running.

4,330,717

PHASE ADJUSTMENT CIRCUIT

Allen K. Coleman, Manchester, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Continuation of Ser. No. 973,301, Dec. 26, 1978. This application Nov. 21, 1980, Ser. No. 209,080
Int. Cl.³ H02J 3/32
U.S. Cl. 307—46 **7 Claims**

1. A circuit for sensing at least one condition in an electrical path and for providing an output signal calculated to change said one condition by a preselected amount, comprising:

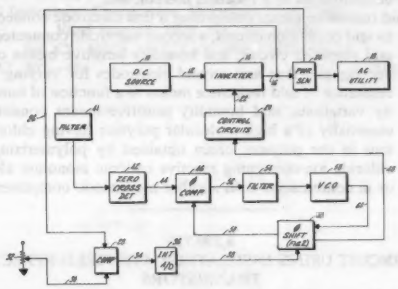
phase comparison means responsive to a waveform in said electrical path and to a feedback signal for providing an error signal proportional to any phase difference between said waveform in said electrical path and said feedback signal;

oscillator means connected to the output of said phase comparator means for providing an output signal whose frequency is proportional to the magnitude of the phase error signal;

sensor means positioned in said electrical path for providing a sensor output signal indicative of said condition in said electrical path;

comparator means connected to receive both said sensor output signal and a reference signal for providing a command signal related to the differences therebetween;

phase shift means disposed in a feedback loop from the output of said oscillator means to said phase comparator



means for responding to said command signal by shifting the phase of said feedback signal; and

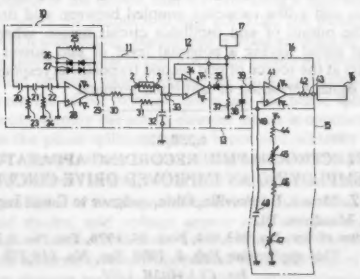
whereby said command signal presented to said phase shift means is indication of a desired deviation, if any, between sensor output signal and said command signal thereby causing said phase comparator means to shift the phase of said feedback signal supplied to said phase comparison by an amount proportional to such desired deviation so that said oscillator means tracks, in frequency, any difference between said at least one condition in said electrical path and said command signal.

4,330,718

HUMIDITY SENSOR AND A HUMIDITY DETECTION CIRCUIT USING THE HUMIDITY SENSOR

Shinichi Kinomoto, Ayabe; Masato Kawamura, Kyoto, and Susumu Kobayashi, Yokohama, all of Japan, assignors to Shinyei Kaisha, Hyogo, Japan

Filed Jun. 20, 1979, Ser. No. 50,220
Claims priority, application Japan, Aug. 24, 1978, 53-103474
Int. Cl.³ H01H *35/42*
U.S. Cl. 307—118 **2 Claims**



1. A humidity detection circuit comprising:

an oscillation circuit for generating an AC signal;

resistance means, connected to said oscillation circuit to receive said AC signal therefrom, for detecting variations in humidity of an atmosphere and for generating an output representative thereof;

an amplifier circuit connected to said resistance means and receiving said output therefrom;

AC-DC converter circuit means for receiving an AC output from said amplifier circuit and converting such AC output into a DC output;

reference input circuit means for generating a reference input;

comparator circuit means for receiving and comparing said DC output and said reference input and for generating an output representative thereof;

control circuit means for receiving said output from said comparator circuit means and for controlling an object to be controlled as a function thereof; and

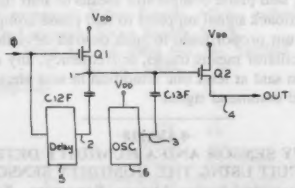
said resistance means comprising a first electrode connected to said oscillation circuit, a second electrode connected to said amplifier circuit, and humidity sensitive means connecting said first and second electrodes for varying the resistance of said resistance means as a function of humidity variations, said humidity sensitive means consisting essentially of a high molecular polymer having chloride ions in the polymer chain obtained by polymerizing a chloride ion-containing reactive cationic monomer alone or in combination with another monomeric component.

4,330,719

CIRCUIT USING INSULATED-GATE FIELD-EFFECT TRANSISTORS

Akira Nagami, Tokyo, Japan, assignor to Nippon Electric Co., Ltd., Tokyo, Japan

Filed May 22, 1979, Ser. No. 41,433
Claims priority, application Japan, May 24, 1978, 53/62670
Int. Cl.³ H03K *17/687*
U.S. Cl. 307—238.3 **13 Claims**



1. A circuit comprising a first insulated-gate, field-effect transistor coupled at its drain to a power source, at its gate to a signal input terminal and at its source to a first circuit node, a second insulated-gate, field-effect transistor which is coupled at its drain to said power source and at its gate to said first node, an oscillator circuit means driven by the said power source, and a first capacitor coupled between said first node and the output of said oscillator circuit means, whereby an output signal having a potential level of said power source appears at the source of said second transistor in response to an input signal appearing at said input terminal.

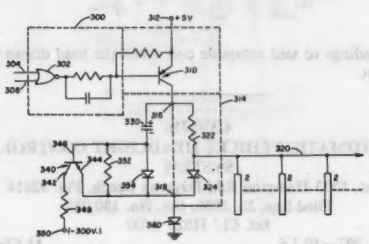
4,330,720

ELECTROGRAPHIC RECORDING APPARATUS EMPLOYING AN IMPROVED DRIVE CIRCUIT

Chad Z. Moore, Brecksville, Ohio, assignor to Gould Inc., Rolling Meadows, Ill.

Division of Ser. No. 963,404, Nov. 24, 1978, Pat. No. 4,215,355.
This application Feb. 4, 1980, Ser. No. 118,278
Int. Cl.³ H03K *3/01*
U.S. Cl. 307—270 **10 Claims**

1. A driver circuit comprising: a current branch having a first end, a second end and an output end; driven circuit connecting means for connecting said current branch with a driven circuit, said driven circuit connecting means connected with said output end of said current branch; electrical storage means having first and second ends with a first end connected with said first end of said current branch; a solid state switching means comprising at least a switch control means for controlling current flow between first and second controlled leads, said switch control means connected with said second end of said electrical storage means, said first controlled lead connected with a high voltage supply and said second controlled lead connected with said second end of said current branch; current control means for controlling current through at least said current branch, said current control means connected with at least said first end of said current branch; and diode means connected with said second end of said current branch for connecting said current branch with a reference potential; wherein said current control means provides a current flow through said current branch, said electrical storage means stores electric energy, said driven circuit connecting means is held near the reference potential, and said solid state switching



means is biased off to prohibit current flow between said first and second controlled leads; when said current control ceases providing a current flow, the electrical storage means forward biases said solid state switching means causing at least said driven circuit connecting means to attain a potential corresponding to the potential of said high voltage supply and causing said diode means to become reverse biased disrupting the connection with the reference potential; and when said current control means next provides current flow through said current path said solid state switching means becomes biased off and said driven circuit connecting means is returned to near said reference potential whereby causing the current control means to interrupt the current flow for a short duration causes a voltage pulse having an amplitude corresponding to the potential of the high voltage supply and a duration substantially the same as the duration of the interruption.

4,330,721

APPARATUS FOR GENERATING TEMPORALLY SHAPED, LASER PULSES

James P. Hauck, Tustin; Cecil L. Hayes, Placentia, and James D. McMullen, Orange, all of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed May 23, 1980, Ser. No. 152,914
Int. Cl.³ H03F *7/00*
U.S. Cl. 307—425 **26 Claims**

1. Apparatus for generating a high-energy temporally shaped, coherent series of laser pulses having signal components on pre-selected rotational vibrational transitions, comprising:

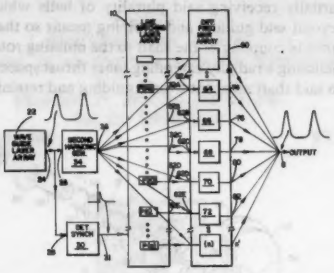
a waveguide laser array having an output comprising a desired temporally shaped coherent series of laser pulses on one pre-selected rotational vibrational transition,

a second-harmonic generator arranged to double the waveguide laser array output frequency,

a line matching laser array having a plurality of outputs of another temporal shape on additional rotational vibrational transitions, and

means comprising an array of difference frequency mixers responsive to synchronized reception of line matching laser array outputs and said frequency doubled waveguide

laser array output to form a corresponding high-energy, coherent series of laser pulses having a waveguide laser



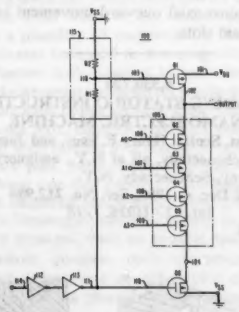
array output-determined temporal shape and line matching laser array output-determined rotational vibrational transitions.

4,330,722

CLOCKED IGFET LOGIC CIRCUIT

George P. Sampson, III, Bernardsville, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Aug. 18, 1980, Ser. No. 178,899
Int. Cl.³ H03K *19/003, 19/096, 19/20*
U.S. Cl. 307—443 **3 Claims**



1. A clocked logic circuit for providing during a first phase of a clock signal an output signal which is a predetermined logical function of the state of a plurality of input signals and for providing during a second phase of the clock signal an output signal at a first logic level, the circuit comprising:

means for providing the clock signal;

first and second terminals respectively adapted to receive a first and a second operating potential;

a plurality of input terminals adapted to receive respective input signals;

an output terminal for providing the output signal;

a first IGFET having a conduction channel coupled between the first terminal and the output terminal and a gate electrode;

a functional network coupled between the output terminal and a first node, the network comprising a plurality of IGFETs each having a gate electrode coupled to a respective one of the input terminals and a conduction channel, the conduction channels of the IGFETs of the functional network being coupled in a configuration to provide the circuit with the predetermined logical function;

means coupling the first node to the second terminal;

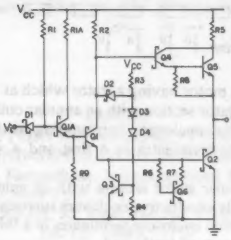
characterized in that there are included means coupled to the gate electrode of the first IGFET responsive to the clock signal for providing during the second phase of the clock signal a first potential level to bias the first IGFET to have a relatively high channel conductance and for providing during the first phase of the clock signal a second potential level to bias the first IGFET to have a relatively low channel conductance but sufficient to permit replenishment of charge at the output terminal lost through undesired leakage.

4,330,723

TRANSISTOR LOGIC OUTPUT DEVICE FOR DIVERSION OF MILLER CURRENT

Paul J. Griffith, Portland, Me., assignor to Fairchild Camera and Instrument Corporation, Mountain View, Calif.

Filed Aug. 13, 1979, Ser. No. 65,991
Int. Cl.³ H03K *19/013, 19/088, 19/084, 5/12*
U.S. Cl. 307—456 **6 Claims**



1. In a transistor logic output device of the type comprising an input and an output for binary data signals of high and low potential, pullup element for sourcing current to the output from high potential, pulldown element for sinking current from the output to low potential, phase splitter element coupled at the input to control the pullup and pulldown elements, said elements comprising junction transistor means, the improvement comprising:

active elements means having a high impedance state when the active element is not conducting and a low impedance state when the active element is conducting, said active element means coupled at the base of the pulldown element transistor means to define a route to ground or low potential of high or low impedance according to the conducting state of the active element means;

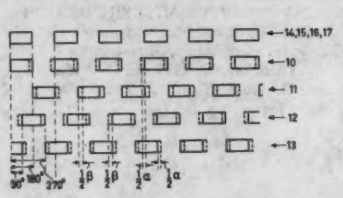
and means controlling the conducting state of said active element means for diverting to ground or low potential, Miller feedback current at the base of the pulldown element generated by potential changes from low to high at the output of the device, and for providing a high impedance when the output is at low potential, the pulldown element is conducting, and current is being supplied by the phase splitter element to the base of the pulldown element;

said active element means comprising an inverse coupling between the active element means and the phase splitter element whereby the active element means is conducting when the phase splitter element is not and whereby the active element means is not conducting when the phase splitter element is, the base of said active element means being coupled to a voltage source through at least first and second diodes, said voltage source also being coupled through at least a third diode to the collector of the phase splitter element for diverting current from the base of the active element means when the phase splitter element is conducting, said diodes selected so that the voltage drop over the path from said voltage source through the third diode, phase splitter element and pulldown element is less than the voltage drop over the path from the voltage source through the first and second diodes and the active element means when the phase splitter element is conducting.

4,330,724
STEPPING MOTOR

Bernardus H. A. Goddijn, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed May 21, 1980, Ser. No. 152,078
Claims priority, application Netherlands, Jun. 20, 1979, 7904818
Int. Cl.³ H02K 37/00
U.S. Cl. 310—49 R 4 Claims



1. A stepping motor having a stator which at least comprises a first annular stator section with an annular coil and a magnetically conductive enclosure surrounding said annular coil, which enclosure terminates in a first and a second annular system of teeth,

a second annular stator section with an annular coil and a magnetically conductive enclosure surrounding said annular coil, which enclosure terminates in a third and a fourth annular system of teeth, and

an axially magnetized annular permanent-magnetic member, which is disposed between said stator sections, coaxially with the two stator sections, the second and the third annular system of teeth adjoining said permanent-magnetic member, and

a rotor having teeth which cooperate with the first, second, third and fourth systems of teeth, the first system of teeth and the second system of teeth making a nominal electromagnetic angle of 180° with each other relative to the rotor teeth, the third and the fourth system of teeth making a nominal electromagnetic angle of 180° with each other relative to the rotor teeth, the first and the fourth system of teeth making a nominal electromagnetic angle of 90° with each other relative to the rotor teeth, and the second and the third system of teeth making a nominal electromagnetic angle of 90° with each other relative to the rotor teeth, characterized in that in order to eliminate stepping angle errors, said angle between the first and fourth system of teeth relative to the rotor teeth is $90°-\alpha$ and the said angle between the second and the third system of teeth is $90°+\beta$, $\alpha+\beta$ being a positive angle of at least 2°, which angular deviations are introduced symmetrically in such a way that said angle between the first and the second system of teeth is substantially equal to said angle between the third and the fourth system of teeth.

4,330,725
NUTATING MOTOR COUPLING

Carmen R. Hintz, Fox Chapel, Pa., assignor to Morgan Actuators, Inc., Seattle, Wash.

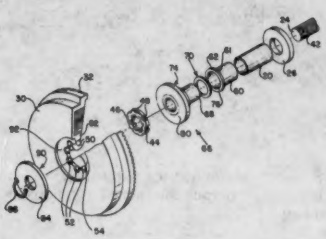
Filed Mar. 10, 1980, Ser. No. 128,652
Int. Cl.³ H02K 1/34
U.S. Cl. 310—82 6 Claims

1. Apparatus for coupling a nutating rotor to a shaft of a motor, comprising:

a plurality of balls;

ball guiding and retaining means fixed to said shaft, said guiding and retaining means having a plurality of elongated slots with a semicircular cross-section formed at the radial periphery thereof, said slots each partially receiving one of said plurality of balls so that a portion of each of said balls projects beyond said guiding and retaining means;

the nutating rotor having a central aperture formed therein and having a plurality of circumferentially spaced, elongated slots, each with a semicircular cross-section formed internally adjacent to said central aperture, said slots partially receiving said plurality of balls which project beyond said guiding and retaining means so that the balls provide coupling of the shaft to the nutating rotor, further including a radially extending inner thrust spacer mounted on said shaft adjacent to said guiding and retaining means,

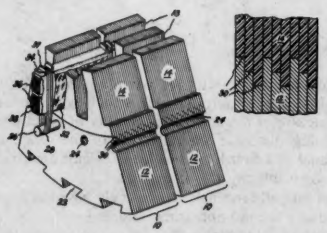


said thrust spacer having a surface for rolling engagement with the nutating rotor for supporting the rotor against inward axial movement and for retaining the balls in said slots, further including an outer thrust spacer mounted on said shaft adjacent the guiding and retaining means opposite the inner thrust spacer with respect to said guiding and retaining means, said outer thrust spacer supporting the rotor against axial outward movement and retaining the balls in said slots.

4,330,726
AIR-GAP WINDING STATOR CONSTRUCTION FOR DYNAMOELECTRIC MACHINE

Donald R. Albright, Scotia; Henry F. Sage, and James B. Archibald, both of Schenectady, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Dec. 4, 1980, Ser. No. 212,984
Int. Cl.³ H02K 1/18
U.S. Cl. 310—254 19 Claims



1. A stator module for a dynamoelectric machine comprising:

an outer, metallic cylinder formed from a plurality of substantially sectorially shaped metallic laminations arranged in a plurality of layers;

an inner, nonmetallic cylinder formed from a plurality of substantially sectorially shaped non-metallic laminations having inwardly projecting teeth so as to define a plurality of slots along the inner circumference of the inner cylinder, said laminations also being arranged in a plurality of layers, said inner laminations being adhesively bonded to said outer laminations; and

wherein the radial dimensions of said metallic and non-metallic laminations vary over adjacent layers, sum of said radial dimensions being constant, so as to define overlap-

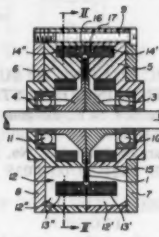
ping areas between the metallic and nonmetallic laminations in said adjacent layers.

4,330,727

ELECTRIC STEP MOTOR

Claude Oudet, 12, rue Capitaine Arrachart, 25000 Besancon, France

Filed Dec. 27, 1979, Ser. No. 107,640
Int. Cl.³ H02K 1/18
U.S. Cl. 310—268 5 Claims



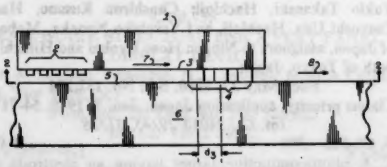
1. An electric step motor comprising a disc-shaped rotor part of permanent-magnetic material which is magnetized in substantially axial direction to exhibit on either side thereof, along an annular zone 2 N regularly arranged magnetic poles of alternating polarity, which rotor part is mounted for rotation upon an axial shaft of the motor, said motor further comprising a plurality of magnetically isolated elementary magnetic circuits mounted in non-magnetic material and at least two electric coils coupled to said elementary circuits, each of said elementary magnetic circuits having an air gap, all of said air gaps being formed at the same radial distance from the motor axis, each air gap being further substantially symmetrical with respect to a common radial plane containing said rotor part, each elementary magnetic circuit comprising at least one flat radially extending U-shaped stator part of high magnetic permeability, said plurality of elementary circuits forming at least two groups in each of which the air gaps are arranged with an angular spacing of $2\pi k/N$, k being a whole number, each elementary circuit being coupled with at least one of said electric coils and each coil being coupled with a plurality of elementary circuits of one of said groups.

4,330,728

SURFACE ACOUSTIC WAVE COUPLING WITH RESPECT TO NON-PIEZOELECTRIC SUBSTRATES

Leland P. Solie, Acton, Mass., assignor to Sperry Corporation, New York, N.Y.

Filed Mar. 31, 1980, Ser. No. 135,409
Int. Cl.³ H01L 41/08
U.S. Cl. 310—313 B 7 Claims



1. A surface acoustic wave signal coupling apparatus comprising:

a first energy propagating element having a strongly piezoelectric surface for propagating thereat surface acoustic waves in a predetermined propagation direction;

transducer means affixed to said piezoelectric surface in energy exchanging relation with said surface acoustic waves;

a second energy propagating element having a surface substantially less piezoelectric than said strongly piezoelectric surface for propagating thereat surface acoustic waves substantially parallel to said propagation direction, said second element surface being disposed immediately adjacent to and opposite from said first element surface; and

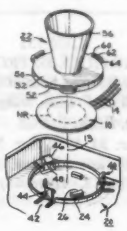
a plurality of equispaced rails aligned substantially perpendicular to said propagation direction disposed between said first element surface and said second element surface for exchanging surface acoustic energy therebetween.

4,330,729

LOCKING SUPPORT ARRANGEMENT FOR A FLEXIBLE SOUND-GENERATING DIAPHRAGM

Michael Byrne, Farranshone, Ireland, assignor to General Electric Company, New York, N.Y.

Filed Jul. 30, 1980, Ser. No. 173,637
Int. Cl.³ H04R 17/10
U.S. Cl. 310—322 14 Claims



1. A sound generating device comprising:

a thin flexible diaphragm having a central axis perpendicular to the plane of the diaphragm,

a first support member axially located on a first side of said diaphragm,

a second support member axially located on a second side of said diaphragm,

said first and second support members each including substantially rigid support means projecting axially therefrom into clamping contact with the respective side of said diaphragm, said support means being axially aligned with each other on said central axis and said support means both being disposed in a circular configuration concentric with said central axis and having a diameter substantially equal to a given node circle of vibration of said diaphragm,

said first support member further including first locking means extending therefrom into engagement with said second support member to axially lock said first and second support members together and thereby maintain said diaphragm in its clamped position between said first and second support means,

said second support member further including second locking means extending therefrom into locking engagement with said first locking means to lock said first locking means in engagement with said second support member, and

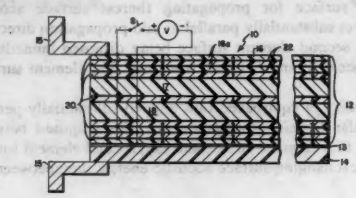
means for vibrating said diaphragm to produce sound.

4,330,730

WOUND PIEZOELECTRIC POLYMER FLEXURE DEVICES

Warren W. Kurz, and J. Kelly Lee, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Mar. 27, 1980, Ser. No. 134,404
Int. Cl.³ H01L *41/08*
U.S. Cl. 310—331 **12 Claims**



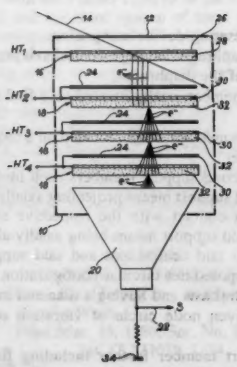
1. In a piezoelectric flexure device comprising a piezoelectric element having means coupled thereto for causing the device to flex in response to subjecting the piezoelectric element to an electric field, the improvement wherein said piezoelectric element comprises a light-weight flexible, elongated mandrel having a generally rectangular cross section with rounded corners, a flexible piezoelectric film which is wound about said mandrel to form a plurality of generally concentric piezoelectric layers free from sharp bends or folds, and electrode means positioned between adjacent concentric layers for *producing an electric field across each of said layers upon* being connected to a voltage source.

4,330,731

PARTICLE DETECTOR

Arlette Garin; Michel Rouger, both of Gif-sur-Yvette, and Jean Saudinos, Paris, all of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed Mar. 31, 1980, Ser. No. 135,245
Claims priority, application France, Apr. 3, 1979, 79 08327
Int. Cl.³ H01J *43/00*
U.S. Cl. 313—104 **6 Claims**



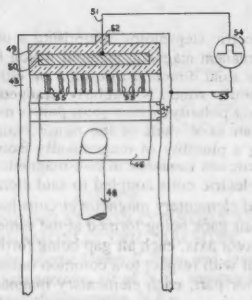
1. A high energy particle detector comprising a vacuum envelope in which there are provided a thin planar target made from a material which can emit secondary electrons when a given particle of sufficient energy strikes the target and an electron multiplier comprising a plurality of thin planar amplifying plates made from a material able to emit secondary electrons when struck by electrons with a sufficient energy, said plates being parallel to the target and spaced from one another, an anode being positioned rearwardly of the amplifying plates and being located within the vacuum envelope, the anode providing the signal proportional to the secondary electrons emitted by the target, the secondary electrons emitted by the target and by each of the plates being accelerated by an appropriate potential difference established between the target and the closest plate and between the various plates, the materials forming the target and the amplifying plates being porous, a shield being associated with each of the plates, each shield being raised to the same voltage as its associated plate to prevent the return to the target of positive ions emitted at the same time as the secondary electrons.

4,330,732

PLASMA CERAMIC COATING TO SUPPLY UNIFORM SPARKING ACTION IN COMBUSTION ENGINES

Frank E. Lowther, Buffalo, N.Y., assignor to Purification Sciences Inc., Geneva, N.Y.

Filed Mar. 14, 1980, Ser. No. 130,577
Int. Cl.³ F02P *13/00*; F02F *3/14*
U.S. Cl. 313—130 **5 Claims**



1. An ignition system for an internal combustion engine in which a piston reciprocates in a combustion chamber between a top dead center position and a bottom dead center position, said ignition system including:

electrical discharge means to provide an electrical discharge from an extended interior area of said combustion chamber to an extended area of said piston to initiate ignition in said combustion chamber,

whereby said discharge occurs substantially throughout the volume of said combustion chamber.

4,330,733

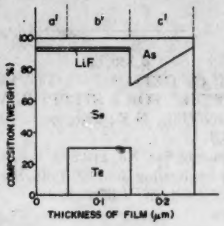
PHOTOCONDUCTIVE TARGET

Keiichi Shidara, Tama; Naohiro Goto, Machida; Tatsuro Kawamura, Tama; Eikyu Hiruma, Komae; Yohitsumu Ikeda; Kenkichi Tanioka, both of Tokyo; Tadaaki Hirai, Koganei; Yukio Takasaki, Hachioji; Chushirou Kusano, Hachioji; Tsuyoshi Uda, Hachioji, and Yasuhiko Nonaka, Mobara, all of Japan, assignors to Nippon Hoso Kyokai and Hitachi, Ltd., both of Tokyo, Japan

Filed May 22, 1980, Ser. No. 152,291
Claims priority, application Japan, Jun. 7, 1979, 54-71767
Int. Cl.³ H01J *29/45, 31/38*
U.S. Cl. 313—386 **5 Claims**

1. A photoconductive target having an electrode and a P-type conductive layer mainly made of Se and having rectifying contact at an interface with said electrode, a portion of said P-type conductive layer being added with at least Te, at least

one metal fluoride forming shallow levels being doped in the region where the signal current is generated for the most part



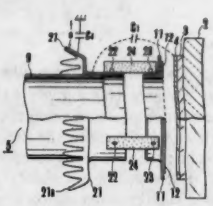
of said P-type conductive layer with an average concentration of not less than 50 ppm and not more than 5% by weight.

4,330,734

IMAGE PICKUP TUBE WITH MESH ELECTRODE SUPPORT

Satoru Miyamoto, Mobara, and Takeo Yoshida, Misaki, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 4, 1980, Ser. No. 118,524
Claims priority, application Japan, Feb. 13, 1979, 54-14224
Int. Cl.[3] H01J *29/02, 29/82, 31/38*
U.S. Cl. 313—390 **6 Claims**



1. In an image pickup tube comprising a cylindrical glass envelope housing an electron gun having a plurality of cylindrical electrodes, a mesh electrode provided co-axially with and in front of said electron gun, a photoconductive target electrode provided at one end of said glass envelope, and an electrode support member provided on the outer periphery of said cylindrical electrodes to achieve alignment of the center axes of said glass envelope and said electron gun, the improvement wherein said electrode support member is fixed to a fore end of said cylindrical electrode most proximate to said mesh electrode, and a substantial width of a cylindrical portion of said electrode support member extends beyond said cylindrical electrode toward said mesh electrode, said substantial width being not overlapped with said fore end, performed projections on said electrode support member and said mesh electrode, and insulating bar-shaped pieces supporting said mesh electrode coaxially and at a fixed gap distance from said fore end by engagement with said projections while the elements of the assembly are held in accurate alignment.

4,330,735

BEAM GUIDE STRUCTURE FOR A FLAT PANEL DISPLAY DEVICE

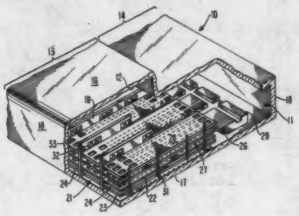
Marvin A. Leedom, Princeton, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Feb. 29, 1980, Ser. No. 125,822
Int. Cl.[3] H01J *29/02*
U.S. Cl. 313—422 **8 Claims**

1. An electron beam guide assembly for a flat panel display device having a frontwall, a baseplate and a plurality of electron beam propagation channels comprising:

a plurality of meshes having apertures arranged longitudinally in columns and transversely in rows; said meshes being arranged in a spaced parallel relationship,

and a plurality of elongated insulating support rod means spaced along the length of both longitudinal edges of said meshes, said elongated support means spanning said meshes and extending uniformly beyond at least one of



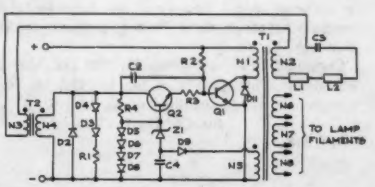
said meshes and being dimensioned to a desired length so that the beam guide assemblies of all of said channels are spaced a uniform distance above said baseplate, said guide meshes being permanently held by said insulating support means to retain said spaced parallel relationship and to retain the longitudinal positions of said rows of apertures.

4,330,736

COMPENSATED CURRENT FEEDBACK OSCILLATOR BALLAST FOR FLUORESCENT LAMPS AND THE LIKE

Lloyd J. Perper, Tucson, Ariz., assignor to Iota Engineering, Inc., Tucson, Ariz.

Continuation-in-part of Ser. No. 26,094, Apr. 2, 1979, abandoned. This application Jun. 9, 1980, Ser. No. 157,879
Int. Cl.[3] H05B *37/02, 39/04, 41/36*
U.S. Cl. 315—209 R **27 Claims**



1. In a high frequency power source for a load such as gas discharge lamps, including an inverter with oscillator circuit and first transformer, said first transformer having primary and secondary windings, said oscillator circuit including a first transistor having base, emitter and collector, with said primary winding connected in series with said first transistor emitter and collector across a pair of dc input terminals, a second transformer having first and second windings, with said first winding connected in series with said secondary winding, and a starter resistor connected between the base of said first transistor and one of said input terminals across said primary winding.

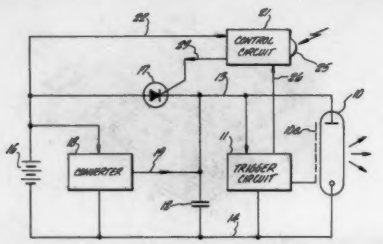
the improvement comprising:

variable resistance means connected between said second winding and said first transistor base providing a drive circuit and responsive to variations in the power delivered to the load at said secondary winding for changing the on time of said first transistor.

4,330,737
ELECTRONIC FLASH SYSTEM

Jean M. Orban, Santa Monica, Calif., assignor to Vivitar Corporation, Los Angeles, Calif.

Filed Jan. 21, 1980, Ser. No. 113,769
Int. Cl.³ H05B 41/32
U.S. Cl. 315—241 P 16 Claims

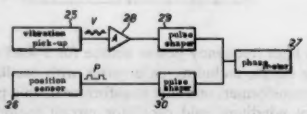


1. An electronic flash system comprising,
a flashtube for emitting a flash of light when ionized and ignited,
trigger circuit means connected with the flashtube for triggering the flashtube to ionize,
a relatively small capacitor means, and means connecting said capacitor means in parallel with said flashtube for igniting the flashtube when the same is ionized, and
DC power source means for supplying a medium voltage and current to said flashtube to cause the flashtube to generate a light output after the flashtube is ignited by the capacitor means, and controllable switch means connecting said power source means in parallel with said flashtube to reduce the typical peak light intensity from the flashtube and to provide a relatively level light output from the flashtube.

4,330,738
METHOD AND APPARATUS FOR CONTROLLING THE FREQUENCY OF VIBRATION IMPARTED TO THE GROUND BY A COMPACTING MACHINE

Michel Paramythioti, Lamorlaye, and Francois Degraeve, Pont Sainte-Maxence, both of France, assignors to Albaret S.A., Rantigny, France

Continuation-in-part of Ser. No. 902,219, May 2, 1978, abandoned. This application Jun. 6, 1979, Ser. No. 46,048
Claims priority, application France, May 9, 1977, 77 14043
Int. Cl.³ B64C 17/02
U.S. Cl. 318—128 16 Claims

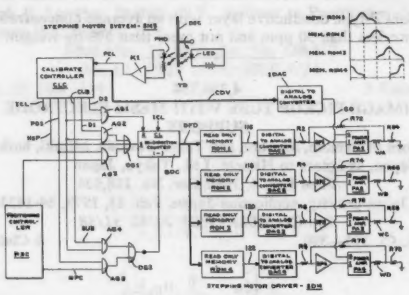


1. Apparatus for controlling the frequency of vibrations imparted to the ground by a vibrating element of a compacting machine driven by an eccentrically loaded rotary shaft, said apparatus comprising a vibration pick-up responsive to vibrations of the mass composed of said vibrating element and the ground vibrated thereby, said vibration pick-up being rigidly mountable on the body of the compacting machine and comprises a U-shaped magnetic circuit, and an armature of magnetic circuit, a periodic vibration signal being provided at terminals of said coil corresponding to the amplitude of vibrations, position sensing means responsive to the angular position of said rotary shaft and being operable to provide a periodic position signal corresponding to the angular position of said rotary shaft, a phasemeter connected to receive said position and vibration signals and being operable to provide a signal related to the phase difference between the position and vibration signals, and an integrator means for integrating the vibration signal provided by said vibration pick-up before it reaches said phasemeter.

4,330,739
METHOD OF DETERMINING OPERATING PARAMETERS FOR A STEPPING MOTOR

David Chiang, Dix Hills, N.Y., assignor to MCC Associates, Short Hills, N.J.

Continuation-in-part of Ser. No. 119,503, Feb. 7, 1980, Pat. No. 4,297,626. This application Jan. 29, 1981, Ser. No. 229,456
Int. Cl.³ G05B 19/40
U.S. Cl. 318—696 3 Claims

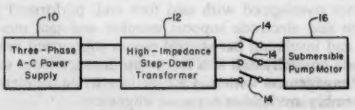


1. For a stepping motor having a rotor which is driven to rotate in response to currents having given waveforms in the stator windings, the method of determining the torque of the motor comprising the steps of exciting the stator windings so that the rotor can oscillate about a given rest position, measuring a time interval related to the oscillatory period of the motor, and converting said time interval to a representation of a torque value.

4,330,740
ENERGIZING CIRCUIT FOR PROVIDING LOW VOLTAGE STARTING FOR SUBMERSIBLE PUMP MOTOR

Lewis R. Shell, Tulsa, and Joseph E. Vandevier, Broken Arrow, both of Okla., assignors to Centrilift-Hughes, Inc., Claremore, Okla.

Filed Sep. 28, 1979, Ser. No. 79,852
Int. Cl.³ H02P 1/26
U.S. Cl. 318—780 3 Claims



1. An energizing circuit for providing low voltage starting for a three-phase submersible pump motor located downhole in a relatively shallow well, comprising:
a three-phase a-c power supply for providing three-phase a-c voltage of relatively high magnitude;
and a three-phase step-down transformer, having its primary windings coupled to said a-c power supply and its secondary windings coupled to the three-phase submersible pump motor, for developing a reduced magnitude three-phase a-c voltage for application to the pump motor to effect rotation thereof,
said transformer having a relatively high impedance so that

during start-up of the pump motor the initially high starting current produces a substantial voltage drop through the high impedance of the transformer, thereby immediately lowering the starting voltage across, and the starting current through, the pump motor.

4,330,741
ELECTRIC CONTROL APPARATUS OF INDUCTION MOTOR

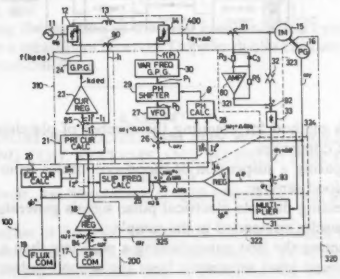
Hiroshi Nagase, Hitachi; Toshiaki Okuyama, Tokai; Yuzuru Kubota, Hitachi, and Katsunori Suzuki, Ibaraki, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jun. 11, 1980, Ser. No. 158,390

Claims priority, application Japan, Jun. 20, 1979, 54-76822; Nov. 12, 1979, 54-145529

Int. Cl.³ H02P *5/40*

U.S. Cl. 318—803 **12 Claims**



1. An electric control apparatus for an induction motor comprising

flux current controller means producing a signal for controlling the exciting current of the induction motor in accordance with a flux command;

secondary current controller means producing a signal for controlling the secondary current of the motor in accordance with a speed command;

pulse generator means for producing outputs for controlling the amplitude, frequency and phase angle of the primary current of the motor in the form of pulse signals according to the output signals of said flux current controller means and said secondary current controller means;

frequency converter means for controlling the voltage and frequency to be applied to the motor according to the pulse signals from said pulse generator means;

primary voltage setting means responsive to said flux command for setting the primary voltage of the motor, primary voltage detecting means for detecting the primary voltage of the motor, voltage regulator means for putting out a signal having a value equivalent to the change of the secondary resistance of the motor according to the difference between the output of said primary voltage detecting means and the output of said primary voltage setting means, and correcting controlling means connected to said pulse generator means for correcting the output for controlling said frequency of the primary current of the motor according to a signal proportional to slip frequency derived from the output signal of said secondary current controller means and a signal proportional to slip frequency change derived from the output signal of said voltage regulator means.

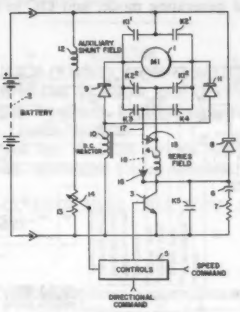
4,330,742
CIRCUITRY FOR RECOVERING ELECTRICAL ENERGY WITH AN ELECTRIC VEHICLE DC PROPULSION MOTOR WHEN BRAKING

Eberhart Reimers, 8807 Strause Ct., Springfield, Va. 22153

Filed Apr. 11, 1980, Ser. No. 139,613

Int. Cl.³ H02J *7/00*; H02P *3/10, 3/14*

U.S. Cl. 320—14 **4 Claims**



1. An electrical drive vehicle with onboard battery energized DC motor drive to at least one wheel of the vehicle wherein; said DC motor has a primary series field winding and an auxiliary shunt field winding, said shunt field winding disposed in electromagnetic coupled relation to said series field winding; said series field winding being energized by the onboard battery when said vehicle is electrically driven; said DC motor including motor controller means with unidirectional conduction means and switching means to change said DC motor from a series field operational mode to a shunt field operational mode during braking of the vehicle such that said DC motor, operational as a shunt field machine, supplies electrical energy, derived from braking motion kinetic energy, to said onboard battery;

wherein said motor controller means includes an intermediate electrical energy storage means electrically connected between said DC motor and said onboard battery such that (1) conversion of motion kinetic energy to electrical energy with storage of such electrical energy, and (2) the supply of electrical energy to the onboard battery, may occur in successive order;

wherein said switching means is a transistor switching means having a variable conduction duty cycle adapted to control the magnitude of magnetic flux excitation of the DC motor when operating in the shunt field operational mode and thereby the magnitude of electrical energy converted from braking motion kinetic energy, and means for controlling the conduction duty cycle time interval such that conversation of electrical energy from braking motion kinetic energy occurs for a determined time interval;

and wherein said transistor switching means is switched from series to shunt by the operator during the braking of said vehicle.

4,330,743
ELECTRICAL AIRCRAFT ENGINE START AND GENERATING SYSTEM

Timothy F. Glennon, Rockford, Ill., assignor to Sundstrand Corporation, Rockford, Ill.

Filed Jul. 17, 1980, Ser. No. 169,699

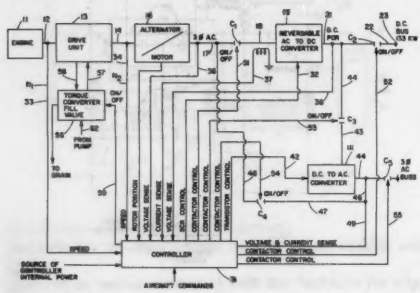
Int. Cl.³ F02N *11/04, 11/14*

U.S. Cl. 322—10 **17 Claims**

1. An electrical aircraft engine start and generating system for use in an aircraft having an engine driven drive unit coupled to an alternator which provides AC power for conversion to DC and AC power, said system including in combination:

a reversible AC to DC converter means controllably electrically coupled to said alternator and a controller means to provide DC power output in a generating mode, said reversible AC to DC converter means capable of receiving externally supplied DC power to be converted to AC power to drive said alternator as a motor in a start mode,

a DC to AC converter means controllably electrically coupled to said controller means and said DC power output during said generating mode, said DC to AC converter



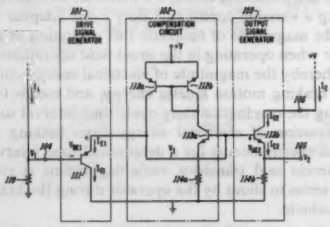
means in said start mode being mutually controllably electrically coupled to said externally supplied DC power, said controller means and said alternator to provide a controlled AC power output to be delivered to said alternator to bring said alternator operating as a motor up to operating speed, whereupon said reversible AC to DC converter responds to said external DC power and is electrically coupled to said alternator to drive said alternator as a motor to deliver rotary power through said drive unit to start said aircraft engine.

4,330,744

PRECISION CONVERTER/ISOLATION CIRCUIT

Milton L. Embree, Reading, and Earl O. Martin, Temple, both of Pa., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Dec. 16, 1980, Ser. No. 216,927
Int. Cl.³ G05F 3/20
U.S. Cl. 323—316 **19 Claims**



1. A converter circuit which generates an output signal (V_2) which is identical to a monitored input signal (V_1) characterized by:

first generating means (101) responsive to the receipt of said input signal (V_1) for generating a drive signal (V_I) which contains the following components: a first error signal (V_{BE1}) and said input signal (V_1);

second generating means (103) connected to said first generating means (101) and responsive to said drive signal (V_I) for generating an output signal (V_2) which contains the following components: a second error signal (V_{BE2}) and said drive signal (V_I), wherein said second error signal (V_{BE2}) is in the opposite sense of said first error signal (V_{BE1});

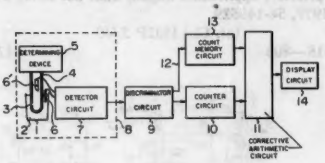
compensation means (102) connected to both said first (101) and said second (103) generating means and responsive to said drive signal (V_I) for equalizing said second error signal (V_{BE2}) and said first error signal (V_{BE1}), to thereby cancel each other in said output signal (V_2).

4,330,745

METHOD AND APPARATUS FOR COUNTING BLOOD PLATELETS

Norihito Hayashi, Hyogo, Japan, assignor to Toa Medical Electronic Co., Ltd., Hyogo, Japan

Filed May 20, 1980, Ser. No. 151,579
Claims priority, application Japan, May 28, 1979, 54/65936
Int. Cl.³ G01N 27/00
U.S. Cl. 324—71 CP **7 Claims**



1. A method for counting the number of platelets in blood which comprises:

preparing a suspension of blood corpuscles from a diluted blood sample;

detecting discrete electrical pulse signals generated by corpuscles suspended in the sample;

counting the first pulses having a peak less than a predetermined level separately from the second pulses having a peak greater than the predetermined level; and

calculating the number of platelets in the suspension by correcting the count of the first pulses on the basis of the formula:

$$PL\ (\times 10^4/mm^3) = Pm\ (\times 10^4/mm^3) - \left(a0 + a1 \cdot \frac{RBC}{100} + a2\left(\frac{RBC}{100}\right)^2 + \ldots + am\left(\frac{RBC}{100}\right)^m\right)$$

wherein PL is the number of platelets; Pm is the first pulse count; a0, a1, a2 . . . , am are correction coefficients; RBC/100 is the concentration of red blood cells ($\times 10^4/mm^3$) in the blood sample.

4,330,746

METHOD AND APPARATUS FOR MEASURING RECEIVED DOPPLER CYCLES FOR A SPECIFIED PERIOD OF TIME

Roy M. Stulting, and Stanley W. Attwood, both of Scottsdale, Ariz., assignors to Motorola Inc., Schaumburg, Ill.

Continuation of Ser. No. 25,260, Mar. 29, 1979, abandoned. This application Jan. 26, 1981, Ser. No. 228,485
Int. Cl.³ G01R 23/02
U.S. Cl. 324—78 D **10 Claims**

1. A method of measuring received Doppler cycles between a start time and a subsequent specific read-out time comprising the steps of:

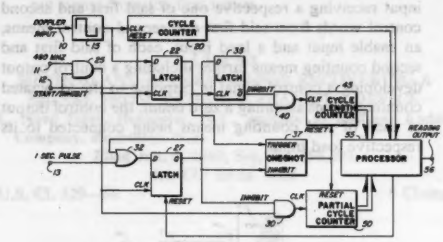
(a) counting the total number of full Doppler cycles between the start and read-out times;

(b) providing a relatively high frequency source of clock pulses;

(c) counting the number of clock pulses in any partial Dop-

pler cycle occurring between the last full Doppler cycle, between the start and read-out time, and the read-out time;

(d) counting the number of clock pulses in a known portion of a Doppler cycle adjacent the partial Doppler cycle and determining therefrom the number of clock pulses in a full Doppler cycle:



(e) dividing the count of clock pulses in the partial Doppler cycle by the count of clock pulses in the full Doppler cycle to obtain a fraction representing the partial Doppler cycle; and

(f) adding the fraction to the total number of full cycles to obtain a measure of received Doppler cycles between start and read-out times.

4,330,747

MEASURING MECHANISM FOR WIDE-ANGLE MOVING COIL SYSTEMS AND METHOD FOR ITS ASSEMBLY

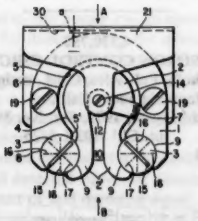
Karl H. Rivoir, Am Nagoldhang 5, 7530 Pforzheim, Fed. Rep. of Germany

Continuation of Ser. No. 51,214, Jun. 22, 1979, which is a continuation-in-part of Ser. No. 838,395, Sep. 30, 1977, Pat. No. 4,208,628. This application Sep. 9, 1980, Ser. No. 186,000

Claims priority, application Fed. Rep. of Germany, Oct. 6, 1976, 2645068; Jul. 4, 1978, 2829265

Int. Cl.³ G01R *5/08*

U.S. Cl. 324—150 **9 Claims**



1. A measuring mechanism for wide-angle moving coil systems, comprising: a mount with a movable part, and a magnetic system including an inner and an outer pole ring and two magnets, wherein a form-locking arrangement of said magnets and said pole rings relative to each other is provided such that said pole rings are mutually centered and fixed in this position in any direction, wherein each of said two pole rings terminates in two arms between which there is arranged a slot or spacing, said inner pole ring having an inner space for receiving the corresponding parts of said movable part including a part of a moving coil frame, which inner space is accessible from the outside through the slot arranged between the arms of said inner pole ring and the width of said slot is dimensioned in such a way that the pre-assembled unit including said mount and said movable part and its corresponding parts can be inserted through said slot into said internal space of said inner pole ring, said measuring mechanism also comprising a measuring mechanism carrier including support arms which extend over said magnetic system and support said magnetic system and said movable part, said support arms having external dimensions whose projection on said magnetic system extends, independent of its rotary position, over said magnetic system, particularly over the region of said outer pole ring, and said pole rings being dimensioned relative to each other and to said movable part so that they can be brought into the operating position in or through said movable part.

4,330,748

FREQUENCY CORRECTION CIRCUITRY FOR PIPELINE SENSOR APPARATUS

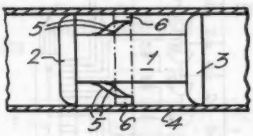
Ernest M. Holden, Newcastle, England, assignor to British Gas Corporation, London, England

Filed Apr. 24, 1979, Ser. No. 33,013

Claims priority, application United Kingdom, Mar. 16, 1979, 799436

Int. Cl.³ G01R *33/00*; G01N *27/72, 27/82*

U.S. Cl. 324—225 **3 Claims**



1. Apparatus for non-destructive testing of an object of ferromagnetic material, comprising:

a probe movable with respect to the object and including means for generating a magnetic field in the object and an electromagnetic sensor responsive to variations in the magnetic field of the ferromagnetic material in the vicinity of the sensor to generate an electrical signal having an amplitude and frequency varying with the velocity of the probe with respect to the object; and

frequency correcting circuit means responsive only to said electrical signal and having a transfer characteristics which is the inverse of the velocity sensitivity of the electromagnetic sensor to compensate for variations in the amplitudes of said electrical signal.

4,330,749

ELECTROMETER APPARATUS

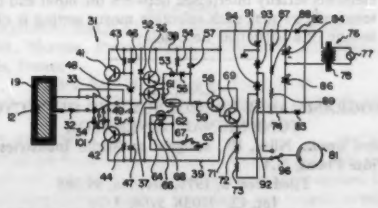
Tadahiro Eda; Susumu Tatsumi, and Chikara Imai, all of Tokyo, Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Oct. 9, 1979, Ser. No. 82,844

Claims priority, application Japan, Dec. 25, 1978, 53-175897[U]; Mar. 6, 1979, 54-25101

Int. Cl.³ G01R *5/28*

U.S. Cl. 324—457 **8 Claims**



1. An electrometer apparatus including an electrode, shield means operatively disposed adjacent to the electrode and an operational amplifier having a non-inverting input connected to the electrode and an inverting input connected directly to

the shield means and to an output of the operational amplifier, characterized by comprising:

offset voltage adjusting means for adjusting an offset voltage of the operational amplifier, the adjusting means being connected to adjust the offset voltage to a value such as to cancel an input bias current of the operational amplifier.

4,330,750

VARIABLE DELAY CIRCUITS

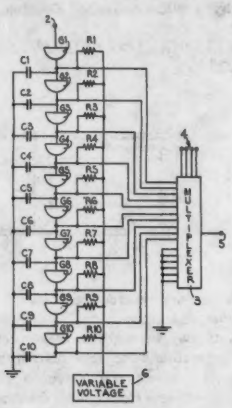
Colin Mayor, Heywood, England, assignor to International Computers Limited, London, England

Filed Mar. 3, 1980, Ser. No. 130,708

Claims priority, application United Kingdom, Mar. 13, 1979, 7908826

Int. Cl.³ H03K 5/159

U.S. Cl. 328—55 **3 Claims**



1. A variable delay arrangement including input and output terminals; a plurality of delay circuit elements, each such element comprising a logic circuit with an "intrinsic" delay period and having input and output connections, the elements being connected in a serial mode by way of the input and output connections with the input connection of the first logic element connected to the input terminal;

means for enabling the separate and individual trimming of the time delay produced by each circuit element;

means for enabling simultaneous collective trimming, independently of the individual trimming, of all of the circuit elements;

a delay element selection means having a plurality of operational settings, a plurality of input connections; and

an output connection connected with said output terminal and a control connection between the output of each said delay element and an associated one of the inputs of the selection means whereby each setting of the selection means represents a predetermined number of the delay elements serially interposed between the input and output terminals, so that each selection means setting is characteristic of a particular time delay.

4,330,751

PROGRAMMABLE FREQUENCY AND DUTY CYCLE TONE SIGNAL GENERATOR

Richard Swain, Niles, Ill., assignor to Norlin Industries, Inc., White Plains, N.Y.

Filed Dec. 3, 1979, Ser. No. 99,588

Int. Cl.³ H03K 5/04, 5/26

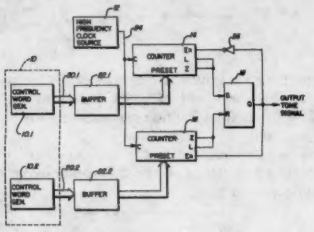
U.S. Cl. 328—61 **1 Claim**

1. Apparatus for generating an output signal having a controllable duty cycle and frequency comprising:

first and second control means adapted for selectively generating respective first and second different multibit control words each representing the desired duration of a respective half-cycle of said output signal;

oscillator means for generating a clock signal comprising a sequence of clock pulses;

first and second presettable down counting means each having a clock input receiving said clock signal, a preset input receiving a respective one of said first and second control words from said first and second control means, an enable input and a load input, each of said first and second counting means further including a control output developing a control signal in response to the associated counting means assuming a zero count, the control output of each of said counting means being connected to its respective load input;



bi-stable means having a set input, a reset input and an output; and

circuit means coupling the load input and control output of said first counting means to the set input of said bi-stable means and the load input and control output of said second counting means to the reset input of said bi-stable means, said circuit means further coupling the output of said bi-stable means in non-inverted form to the enable input of one of said counting means and in inverted form to the enable input of the other of said counting means, whereby said output signal is developed in the form of a continuous succession of logically high and low signal states at the output of said bi-stable means.

4,330,752

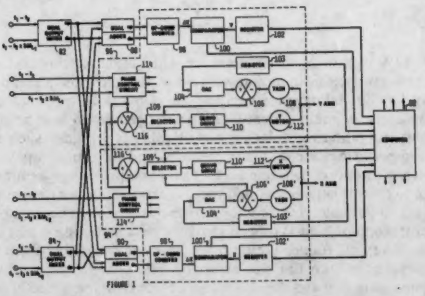
POSITION CONTROL CIRCUIT

Ruediger F. Rauskolb, Palo Alto, Calif., assignor to Optimetrix Corporation, Mountain View, Calif.

Filed May 14, 1979, Ser. No. 38,667

Int. Cl.³ H03K 5/26

U.S. Cl. 328—134 **15 Claims**



1. A position control circuit comprising:

first means, responsive to a reference signal and to a control signal, for producing an output signal having the same

frequency as the reference signal and having a phase determined by the control signal; and

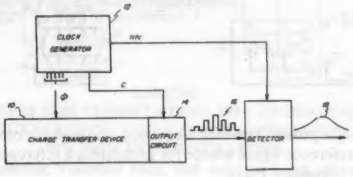
second means, coupled to the first means and responsive to the output signal from the first means and to an input signal having a frequency related to the reference signal, for producing a position control signal proportional to the difference in phase between the input signal and the output signal from the first means.

4,330,753

METHOD AND APPARATUS FOR RECOVERING A SIGNAL FROM A CHARGE TRANSFER DEVICE

L. Nevil Davy, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jun. 4, 1980, Ser. No. 156,293
Int. Cl.³ H03K 9/02
U.S. Cl. 329—50 8 Claims



1. Apparatus for recovering a baseband signal from the output signal produced by a charge transfer device, said charge transfer device being driven by periodic clock signals, to move a serial train of charge packets, representing periodic samples of a baseband signal, to an output location, and including output circuit means for sensing said serial train of charge packets at said output location and producing in response thereto a pulse amplitude modulated signal having a pulse repetition frequency f_c, said pulse amplitude modulated signal comprising a baseband component and a series of sideband components disposed about harmonics of the pulse repetition frequency of said output signal, said signal recovery apparatus comprising:

means connected to said output circuit means to receive said output signal for demodulating the sideband components of said output said signal disposed about a selected frequency Nf_c, where N is an integer, to produce a detected signal having a baseband component representing the baseband component of said output signal and a series of sideband components; and

low pass filter means connected to said demodulating means to receive said detected signal for passing only said baseband component of said detected signal.

4,330,754

SOUND AMPLIFIERS

Peter Hartley, 198 Brookhill, Sheffield 3, England

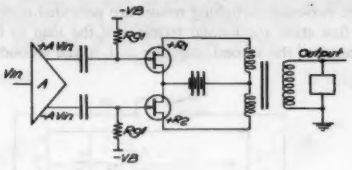
Filed Jan. 23, 1980, Ser. No. 114,513
Claims priority, application United Kingdom, Jan. 25, 1979, 7902683
Int. Cl.³ H03F 3/26; G10H 1/06
U.S. Cl. 330—264 3 Claims

1. A transistor amplifier, comprising:

means for receiving an input electrical signal to be amplified;

low power voltage amplifying means responsive to said input signal for generating a voltage amplified signal, said voltage amplifying means including field effect transistor means for simulating push-pull, transformer coupled vacuum tube amplifier transfer characteristics by push-pull amplifying said input signal;

power amplifier means responsive to said voltage amplified signal to develop a power amplified signal; and



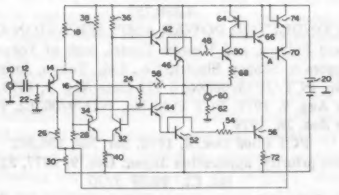
means for supplying said power amplified signal to a speaker load.

4,330,755

POWER-AMPLIFYING CIRCUIT

Hiroyasu Yamaguchi, Yokohama, and Takashi Ishii, Fujisawa, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Filed Mar. 26, 1980, Ser. No. 134,302
Claims priority, application Japan, Mar. 31, 1979, 54-38638
Int. Cl.³ H03F 3/26
U.S. Cl. 330—271 5 Claims



1. A power-amplifying circuit comprising:

pre-amplifier means for amplifying an input signal and sending forth amplified output signals in differential modes with respect to each other;

output means including first and second transistors jointly carrying out a push-pull operation in accordance with the polarity of said output signals from the pre-amplifier means; and

operation means which detects output signals from the first and second transistors, supplies a signal corresponding to a product of both output signals to said pre-amplifier means through a negative feedback path to regulate signals of the first and second transistors and is provided with a compensation resistor connected to a signal path extending from said output means to said pre-amplifier means having a resistance for counterbalancing a parasitic resistance occurring in the first and second transistors.

4,330,756

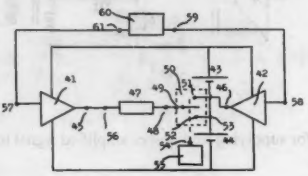
AUDIO-FREQUENCY AMPLIFYING DEVICE

Jean M. Moreau, Paris, France, assignor to Thomson-CSF, Paris, France

Filed Jun. 25, 1980, Ser. No. 162,740
Claims priority, application France, Jun. 27, 1979, 79 16558
Int. Cl.³ H03F 3/20
U.S. Cl. 330—297 8 Claims

1. An audio-frequency amplifying device, comprising a first and a second amplifier, the first amplifier being supplied from a source supplying a voltage V1 whose two output terminals are at symmetrical potentials with respect to a zero potential terminal, said amplifying device delivering across a load comprising first and second terminals, the first terminal being connected to the output terminal of the first amplifier, wherein

the second amplifier is supplied from a source of supply voltage V2 whose terminals are at symmetrical potentials with respect to the zero potential terminal, and wherein furthermore two-state switching means are provided connecting, in the first state, the second terminal of the load to the output terminal of the second amplifier and, in the second state, the



second terminal of the load to the zero potential terminal, control means for forcing the switching means into one or the other of their states depending on the level of the signal to be amplified by the amplifying device, and transmission means for applying to the second amplifier an input signal depending on the signal to be amplified and on the output voltage of the first amplifier.

4,330,757

SEMICONDUCTOR POWER AMPLIFICATION CIRCUIT

Hirokazu Fukaya, and Hisashi Togari, both of Tokyo, Japan, assignors to Nippon Electric Co., Ltd., Tokyo, Japan

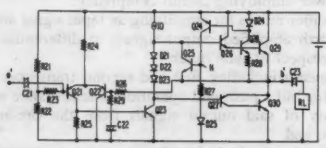
PCT No. PCT/JP78/00046, § 371 Date Aug. 9, 1979, § 102(e) Date Aug. 9, 1979, PCT Pub. No. WO79/00362, PCT Pub. Date Jun. 28, 1979

PCT Filed Dec. 8, 1978, Ser. No. 154,392

Claims priority, application Japan, Dec. 9, 1977, 52/148371

Int. Cl.³ H03F *3/30*

U.S. Cl. 330—298 **10 Claims**



1. A semiconductor power amplification circuit comprising: a signal input terminal; a first and a second transistor operating by respective parts of the input signal applied to said input terminal so as to output an output signal according to said input signal, and being serially connected between a first and a second power supply line, said first power supply line feeding current to the collector of said first transistor; a circuit supplying a current to the base of said first transistor; an output terminal electrically connected to a common connecting terminal of said first and second transistors; a third transistor having its base connected to the base of said first transistor said third transistor being of the same conductivity type as said first transistor; means for DC-connecting the emitter of said third transistor to the emitter of said first transistor; a current mirror circuit having an input circuit connected between the collector of said third transistor and said first power supply line; a fourth transistor having a base receiving the output of said current mirror circuit at a first connecting point, an emitter electrically connected to said output terminal, and a collector electrically connected to said circuit supplying a current to the base of said first transistor; and a current-voltage conversion means connected between said first connecting point and said second power supply line.

4,330,758

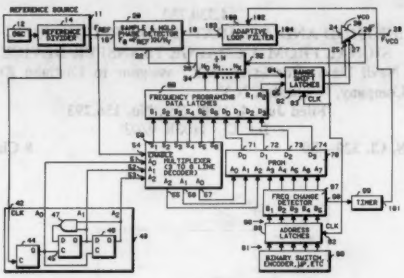
SYNCHRONIZED FREQUENCY SYNTHESIZER WITH HIGH SPEED LOCK

Scott N. Swisher, Elk Grove; Richard E. Barnett, Palatine, both of Ill., and Paul K. Griner, Maryland Heights, Mo., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Feb. 20, 1980, Ser. No. 122,929

Int. Cl.³ H03L *7/18*

U.S. Cl. 331—1 A **4 Claims**



1. An improved fast-lock frequency synthesizer comprising:
a. a reference signal source for generating a reference signal of frequency F_{REF};
b. a voltage controlled oscillator, for producing an oscillator signal at its output in response to a control signal applied to its input and having a gain K_V;
c. programmable divider means for frequency dividing the controlled oscillator signal by a divisor N;
d. a sample-and-hold phase comparator means, having a first input coupled to the reference signal source, a second input coupled to the divider means, and an output coupled to the voltage controlled oscillator, for producing the control signal at its output, representative of the phase difference of the signals received at the first and second input, said phase comparator having a gain K_ϕ approximately given by the expression $K_{100}=N\times F_{REF}/K_V$, where K_ϕ is expressed in volts/radian, F_{REF} is expressed in hertz, and K_V is expressed in radians/volt-sec.

4,330,759

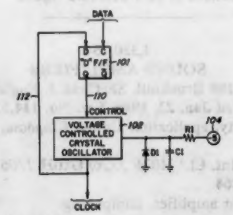
APPARATUS FOR GENERATING SYNCHRONIZED TIMING PULSES FROM BINARY DATA SIGNALS

Thomas W. Anderson, Warrenville, Ill., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Mar. 5, 1980, Ser. No. 127,477

Int. Cl.³ H03L *7/08*

U.S. Cl. 331—14 **5 Claims**



1. A clock pulse generating circuit comprising a voltage controlled oscillator having a base frequency and having a control terminal and an output terminal, characterized in that said circuit further comprises clocked bistable means having first and second stable states and having an output termi-

nal directly connected to said control terminal, a first input terminal connected to said oscillatior output terminal, and a second input terminal connectable to a data source;

said bistable means being responsive to clock pulses having leading and trailing edges occurring on said first input terminal and data pulses having leading and trailing edges occurring on said second input terminal to apply to said control terminal a first control signal when the leading edge of a data pulse is preceded in time by a predetermined edge of a corresponding clock pulse and a second control signal when the leading edge of a data pulse precedes said predetermined edge of a corresponding clock pulse;

said oscillator being responsive to said first control signal to provide a clock signal having a frequency which is less than said base frequency by a predetermined value and responsive to said second control signal to provide a clock signal having a frequency which is greater than said base frequency by a predetermined value.

4,330,760
SYSTEM FOR CORRELATING THE OPERATING FREQUENCIES OF TWO VARIABLE-FREQUENCY MICROWAVE GENERATORS

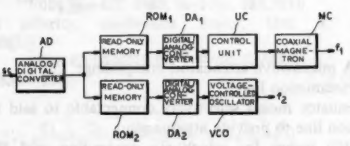
Guido Busacca; Vincenzo Meli, and Antonio Rossi, all of Palermo, Italy, assignors to Societa Italiana Telecomunicazioni Siemens S.p.A., Milan, Italy

Filed Feb. 27, 1980, Ser. No. 125,265

Claims priority, application Italy, Feb. 28, 1979, 20613 A/79

Int. Cl.³ G01S *13/00*; H03L *7/00*

U.S. Cl. 331—55 **8 Claims**



1. A system for producing two microwave oscillations of different frequencies varying in a correlated manner, comprising:

a first and a second microwave generator tunable in different frequency ranges, one of said microwave generators being a coaxial magnetron, the other being a voltage-controlled oscillator;

a source of pilot signal varying within predetermined limits; and

first and second tuning means inserted between said source and said first and second microwave generators, respectively, for modifying the operating frequencies thereof in response to said pilot signal, at least said first tuning means including a read-only memory storing digitized setting instructions for said first microwave generator and further including coupling means for addressing said memory in response to said pilot signal for reading out setting instructions which modify the operating frequency of said first microwave generator in conformity with the modification of the operating frequency of said second microwave generator by said pilot signal, the tuning means associated with said magnetron comprising a drive motor with a rotating shaft, sensing means emitting a feedback signal depending on the angular position of said shaft, and comparison means for deriving from said pilot signal and said feedback signal an error signal controlling said drive motor.

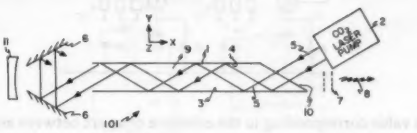
4,330,761
HIGH POWER GAS LASER

Daniel R. Cohn, Boston; Benjamin Lax, Chestnut Hill, and Kenneth J. Button, Belmont, all of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Jun. 28, 1976, Ser. No. 700,657

Int. Cl.³ H01S *3/091*

U.S. Cl. 372—4 **9 Claims**



1. A high-power, pulse-mode far infrared gas laser that comprises, in combination: an elongate chamber containing a large volume of a molecular gas with rotational quantum levels whose energy spacing lies in the far infrared region of the electromagnetic spectrum; a CO_2 pump laser positioned to direct its radiation in the form of pulses into the chamber at an acute angle to the axis of the chamber; two plane mirrored surfaces in the chamber positioned to receive the CO_2 laser pump beam and to cause the incident CO_2 laser pump beam to execute a zig-zag path through the gas with a longitudinal component, the CO_2 laser radiation serving to invert the energy levels of said gas, the path of the CO_2 laser pump beam within the chamber being one which serves to illuminate the molecular gas substantially uniformly and completely; and a curved rear mirror and a mesh front mirror that act in combination to form a resonant cavity which results in narrow linewidth far infrared laser radiation that emits from the resonant cavity; said zig-zag path serving to provide a relatively long absorption path of length L within the chamber without unduly lengthening the resonant cavity; the length L being related to the gas pressure within the chamber and to the intensity of the CO_2 laser to assure that substantially all the molecular gas within the chamber is pumped to saturation, in which the CO_2 laser is positioned to direct its radiation into the chamber at one longitudinal end of the resonant cavity and which includes reflector means at the other longitudinal end or far end of the resonant cavity to return the CO_2 laser radiation back down the chamber making it possible to illuminate uniformly and to saturation substantially all the gas within said chamber, in two passes.

4,330,762
CIRCUIT FOR STABILIZING AN ELECTRICAL DISCHARGE WITHIN A GLOW DISCHARGE GAS LASER

Alan S. Kaye, Wantage, and Peter Millward, Didcot, both of England, assignors to United Kingdom Atomic Energy Authority, London, England

Filed Mar. 3, 1980, Ser. No. 127,000

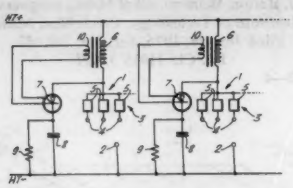
Claims priority, application United Kingdom, Mar. 21, 1979, 7909986

Int. Cl.³ H01S *3/097*

U.S. Cl. 372—85 **9 Claims**

1. A circuit for stabilising an electrical discharge within a glow discharge gas laser having a cathode electrode and a segmented anode electrode, each segment of the segmented anode electrode consisting of groups of individual anode electrodes connected in parallel wherein there is provided a bi-stable switching device connected in series with a capacitor across each segment of the anode electrode, and a main inductor connected in series with each segment of the anode the main inductor having a secondary winding which is connected so as to operate the bi-stable switching device to cause the

segment of the anode electrode to be shunted by the capacitor when the current flowing through the main inductor is above



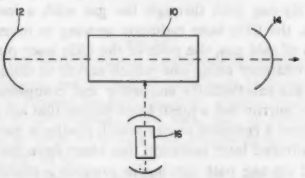
a value corresponding to the existence of an arc between any of the individual anode electrodes and the cathode electrode.

4,330,763

RESONANTLY PUMPED MID-IR LASER

Leon Esterowitz, Springfield, Va., and Melvin R. Kruer, Oxon Hill, Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Mar. 19, 1980, Ser. No. 131,349
Int. Cl.³ H01S *3/16*
U.S. Cl. 372—41 **5 Claims**



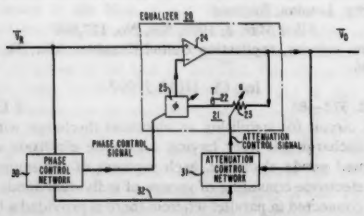
1. An optically pumped solid-state laser which comprises:
a laser cavity;
a laser medium including trivalent terbium-doped yttrium lithium fluoride crystal that is capable of lasing at about 4.1 μm disposed within said laser cavity; and
resonant pumping means for supplying pump energy of a predetermined infrared wavelength to said laser medium to achieve laser oscillation at about 4.1 μm.

4,330,764

MULTIPATH FADE EQUALIZER

Hotze Miedema, Boxford, Mass., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Jun. 11, 1980, Ser. No. 158,404
Int. Cl.³ H03H *11/06*
U.S. Cl. 333—18 **9 Claims**



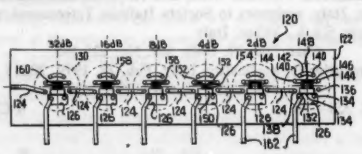
1. An adaptive fade equalizer comprising:
differencing means (**24**) for forming a difference between an input signal to said equalizer and a component of the output signal from said differencing means, where said differencing means output signal is also the equalizer output signal, and said input signal has a center frequency f_c and a bandwidth B;
a feedback loop (**21**) for coupling said component of output signal to said differencing means;
said loop including;
a fixed delay T (**22**);
a variable attenuator (**23**);
and a variable phase shifter (**25**);
a phase control network (**30**) for determining the location of a fade notch in said input signal, and for generating a phase control signal for adjusting said phase shifter in response to said determination;
and an attenuation control network (**31**) for comparing the relative amplitudes of signal components at selected frequencies in said input and output signals, and for generating an attenuation control signal for adjusting said attenuator in response to said comparisons.

4,330,765

SWITCHABLE MICROWAVE STEP ATTENUATOR WITH COMPENSATION FOR LINEAR OPERATION OVER WIDE FREQUENCY RANGE

Robert J. Patukonis, Ijamsville, Md., assignor to Weinschel Engineering Co., Inc., Gaithersburg, Md.

Continuation-in-part of Ser. No. 124,663, Feb. 26, 1980, abandoned. This application Jun. 5, 1980, Ser. No. 156,834
Int. Cl.³ H01P *1/22*
U.S. Cl. 333—81 A **27 Claims**



1. A microwave attenuator, comprising:
a transmission line;
attenuator means selectively connectable to said transmission line to provide attenuation;
switch means for selectively connecting said attenuator means to said transmission line;
said switch means having inherent interelectrode capacitance causing the impedance of said attenuator means to vary measurably as a function of frequency of signals on said transmission line at, at least, the upper frequencies of a frequency range to 2 gigahertz;
said attenuator means and transmission line being characterized by an optimal electrical length for a desired level of attenuation and switch capacitance, and
means, having reactive impedance included in said attenuator means, providing compensation for deviation from said optimal electrical length resulting from said switch capacitance to maintain a constant level of attenuation over a desired frequency range.

4,330,766

ELECTROMECHANICAL SWITCH

Chester J. Pentlicki, Gaithersburg, Md., assignor to Communications Satellite Corporation, Washington, D.C.

Filed May 29, 1980, Ser. No. 154,256
Int. Cl.³ H01P *1/10*
U.S. Cl. 333—105 **12 Claims**

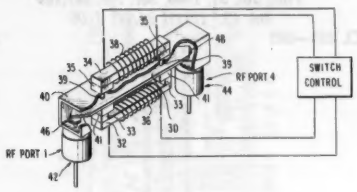
1. An electromechanical reed switch comprising:
input and output switch contacts;
a conductive reed member movable between at least a first position in which it abuts said input and output contacts and a second position apart from said input and output switch contacts;

a first permanent magnet for holding said reed member in said first position;

a second permanent magnet for holding said reed member in said second position;

a first electromagnetic coil surrounding said first permanent magnet;

a second electromagnetic coil surrounding said second permanent magnet; and



means for selectively energizing at least one of said first and second electromagnetic coils to oppose or enhance the magnetic fields of at least one of said first and second permanent magnets and thereby move said reed member to a selected one of said first and second positions where it is held by one of said first and second permanent magnets upon deenergization of said at least one selectively energized coil.

4,330,767

SURFACE ACOUSTIC WAVE DEVICE

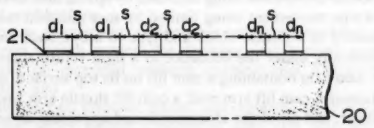
Hajime Miyajima, and Akio Nakakura, both of Sakado, Japan, assignors to Toko, Inc., Tokyo, Japan

Filed Sep. 25, 1980, Ser. No. 190,715

Claims priority, application Japan, Oct. 8, 1979, 54/139420[U]

Int. Cl.³ H03H *9/25, 9/64, 9/145*

U.S. Cl. 333—150 **2 Claims**



1. A surface acoustic wave device including an input electrode and output electrode, each of said electrodes being formed of metal on a piezoelectric substrate, one of the input and output electrodes comprising a phase-modulated interdigital electrode, and the other comprising a uniform interdigital electrode with an equal electrode finger width and spacing, characterized in that the ratio of the metal surface area to the unmetallized surface area in said phase-modulated electrode is equal to the ratio of the metal surface area to the unmetallized surface area in said uniform interdigital electrode.

4,330,768

DISPERSION COMPENSATED ACOUSTIC SURFACE WAVEGUIDES USING DIFFUSED SUBSTRATES

Peter H. C. Huang, Alexandria, Va.; Joseph F. Weller, Oxon Hill, Md., and Thomas G. Giallorenzi, Springfield, Va., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 2, 1980, Ser. No. 192,962

Int. Cl.³ H03H *9/42, 9/68, 9/70;* **H01L** *41/22*

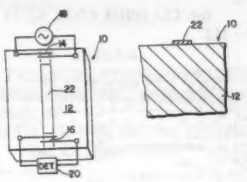
U.S. Cl. 333—153 **19 Claims**

1. An electronic device comprising:

piezoelectric means for propagation of an elastic wave, said piezoelectric means having at least one means forming a surface over which an elastic wave is adapted to travel;

transducer means for converting an electrical signal to an elastic wave;

metallic film means in contact with said surface means for electrical interaction with an elastic wave propagated over said surface means,



at least a portion of said surface means being at least partially diffused so as to effect a change in the wave propagating properties of said piezoelectric means;

whereby due to different wave propagating properties in different portions of said surface means, said wave is effectively channeled as it travels across said piezoelectric means.

4,330,769

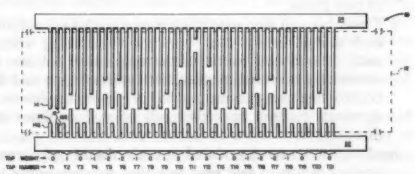
SINGLE ELECTRODE SENSE CIRCUIT FOR CHARGE-COUPLED TRANSVERSAL FILTERS

Ralph T. Dean, Richardson; David A. Sealer, Dallas, and James R. Hellums, Carrollton, all of Tex., assignors to Mostek Corporation, Carrollton, Tex.

Filed Feb. 7, 1980, Ser. No. 119,578

Int. Cl.³ H03H *15/02;* **G11C** *19/28;* **H03K** *5/156*

U.S. Cl. 333—165 **20 Claims**



1. A charge coupled device transversal filter comprising:

a semiconductor substrate having an extended active region adapted for sequential transfer of charge packets along a longitudinal axis;

first and second split electrodes each positioned on said substrate generally perpendicular to said axis and each having a sense portion and a complementary dummy portion overlying said active region, said first and second split electrodes defining a tap having a weight corresponding to a preselected difference in length of said sense portions overlying said active region;

a sense line connected to the sense portions of said first and second split electrodes;

a dummy line connected to the dummy portions of said first and second split electrodes and to a source of a reference voltage;

means for charging said sense line to said reference voltage when a charge packet is located in a sense well defined by said first split electrode;

means for shifting a charge packet from said first sense well to a second sense well defined by said second split electrode; and

integrating amplifier means coupled to said sense line for detecting the difference in displacement charges induced in said sense portions by shifting of a charge packet from said first sense well to said second sense well.

4,330,770

MAGNETICALLY CONTROLLED SWITCHING DEVICE

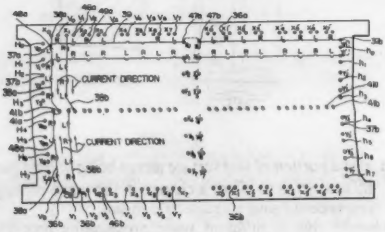
Hirotaka Kashiwabara; Mamoru Shirai, and Shinichi Inoue, all of Kawasaki, Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Dec. 10, 1979, Ser. No. 101,689

Claims priority, application Japan, Dec. 15, 1978, 53/173267[U]

Int. Cl.³ H01H *67/30, 63/33*

U.S. Cl. 335—112 **8 Claims**



1. A magnetically controlled switching device comprising:

a magnetic shunt plate with insulated terminals arrayed along peripheral portions thereof,

a plurality of coil forms located to define crosspoints of a matrix corresponding to rows and columns along X and Y coordinate directions, respectively, on each of the top and bottom surfaces of said shunt plate,

an X coil control line extending along each said row on each said surface of said shunt plate and being wound on each of said coil forms in the respective row in an alternately reversed manner, both ends of each said X coil control line being connected to corresponding ones of said terminals located on said shunt plate near the ends of said rows of coil forms,

a Y coil control line extending along each said column on each said surface of said shunt plate and being wound on each of said coil forms in the respective column in an alternately reversed manner, both ends of each said Y coil control line being connected to corresponding ones of said terminals located near the ends of said columns in the direction Y,

reed switches accommodated in each of said coil forms, the contact points of said reed switches corresponding to the plane of said shunt plate,

a respective connection wire extending along each said row and column on each of said shunt plate to connect in common the respective terminals of said reed switches of each said row and column of each surface of said shunt plate,

a relay terminal plate located parallel to said Y coordinate direction between two of said columns of said coil forms, said relay terminal plate comprising a pair of insulated coil relay terminals corresponding to each one of said rows of coil forms, said relay terminal plate dividing said matrix of coil forms on both surfaces of said shunt plate into two groups,

each said X coil control line on the top surface of said shunt plate being connected by the respective coil relay terminal of said relay terminal plate to the respective X coil control line on the bottom surface that is wound on the coil forms at identical crosspoints of said matrix, and said X coil control lines in each said row being wound in the same respective direction on the two coil forms adjacent to said relay terminal plate in each respective row, said respective winding direction alternating along said relay terminal plate,

said X coil control lines being cut between said pairs of said relay terminals so as not to connect in common the two portions of each said row divided by said relay terminal plate, and

each said connecting wire extending along the respective row in the X direction being cut at the portion corresponding to said relay terminal plate to form two independent matrices on said magnetic shunt plate.

4,330,771

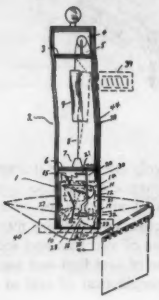
PENDULUM SWITCH

James R. McGovern, 205 E. 239th St., Bronx, N.Y. 10470

Filed Jul. 31, 1980, Ser. No. 147,109

Int. Cl.³ H01H *36/00, 3/00*

U.S. Cl. 335—205 **1 Claim**



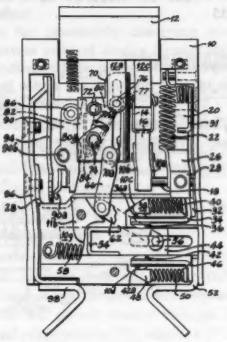
1. An on-off light switch device comprising a cylinder housing, a magnetically responsive bar set on a flexible rod that is set in a flexible mound, a line that is fastened to said bar at one end and extends from there past a ram, cam, and pendulum mechanism, and is then fastened to an anchored coil spring, said pendulum and said cam each containing complimentary contact points which when joined complete what constitutes a usable circuit, said pendulum's clockwise and/or counterclockwise movement being limited by stop pins, said cam's clockwise movement being retarded by spring and its counterclockwise movement being limited by stop pin, said ram being contained in a shuttle block and free to move back and forth horizontally under the influence of a light return spring pressure, said cam containing a cam lift on its top surface, said ram containing a cam lift arm post, a cam lift shuttle arm, and a cam lift lever, and all of the aforementioned apparatus arranged so that initial momentary application of an electromagnetic force to any point on the circumference of said housing's upper vertical surface will produce a typical sequence of action in said switch amounting to snapping said bar against the interior surface of said housing and in so doing, jerk said line against said ram snapping it forward so that it pops said pendulum and causes it to swing and its top to encounter said cam and to brush along the lower side of said cam causing said cam to flip up and hang up on the top portion of said pendulum thereby establishing a circuit completing contact to be made between said pendulum and said cam; the forward movement of said ram having been accompanied by the forward movement of said cam lift arm, said lift lever on said arm moving through the area that said cam lift occupies in its full-up position, which is slightly higher than its contact position, before said cam lift reaches a full-up position, and therefore misses encountering said cam lift; and subsequent momentary application of said electromagnetic force to said housing, snaps said bar and jerks said line against said ram and snaps it forward to its limit, however said cam lift lever in this subsequent sequence encounters and overrides said cam lift in its forward movement as said lever is displaced counterclockwise, and then encounters and its clockwise movement stopped as it underrides and lifts said lift and cam thereby releasing said pendulum and disengaging said completed contact.

4,330,772

PUSHBUTTON CIRCUIT BREAKER SWITCH

Jerome K. Hastings, Sussex, and George F. Lamboy, Waukesha, both of Wis., assignors to Eaton Corporation, Cleveland, Ohio

Filed May 2, 1980, Ser. No. 146,947
Int. Cl.³ H01H 73/30
U.S. Cl. 337—43 14 Claims



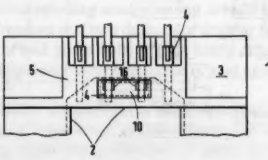
1. A circuit breaker switch comprising in combination:
an insulative housing;
first switch means mounted within said housing, comprising at least two contacts;
second switch means mounted within said housing, comprising at least two contacts, electrically connected in series with said first switch means;
a pushbutton extending from one side of said housing;
first actuation means, connecting said pushbutton to said first switch means, for closing and reopening said contacts of said first switch means in response to first and second operations of said pushbutton;
second actuation means, connecting said pushbutton to said second switch means, for closing said contacts of said second switch means in response to said first operation of said pushbutton;
trip means, electrically connected in series with said first and second switch means, for opening said second switch means on overload without opening said first switch means; and
first and second terminal means, one connected to each end of the series circuit comprising said first and second switch means and said trip means, for connecting said circuit to a source of electrical current.

4,330,773

COIL FORM WITH HEAT SWITCH

Peter Hofsiss, Strietweg 45, D-7530 Pforzheim, Fed. Rep. of Germany

Filed Apr. 25, 1980, Ser. No. 143,774
Claims priority, application Fed. Rep. of Germany, Apr. 25, 1979, 2916639; Apr. 25, 1979, 2916664
Int. Cl.³ H01H 37/54
U.S. Cl. 337—365 23 Claims



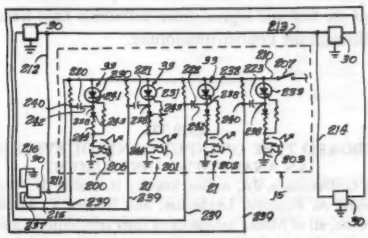
1. A coil form for accommodating at least one coil winding and a heat switch means, the coil form including a recess means for receiving the heat switch means, the heat switch means including at least one switching element and a housing means at least a portion of which is adapted to be inserted into the recess means, characterized in that the housing means is open at least in an area thereof adapted to be inserted into the recess means, and in that the housing means includes means for closing off the recess means.

4,330,774

TIRE PRESSURE SENSING SYSTEM

Gerald A. Doty, Crown Point, Ind., assignor to Gateway Industries, Inc., Chicago, Ill.

Filed Feb. 19, 1980, Ser. No. 122,288
Int. Cl.³ B60C 23/02
U.S. Cl. 340—58 26 Claims



1. A pressure indicating system for continually monitoring tire pressure in a moving vehicle comprising:
pressure sensing means adapted to be attached to a vehicle wheel in communication with a pneumatic tire,
a permanent magnet means operable by said pressure sensing means in response to changes in pressure in the tire between a first position when the pressure in the tire is above a predetermined lower limit and a second position when the pressure in the tire falls below said predetermined lower limit,
a Hall effect magnetic switch means without opening and closing contacts to be carried by a non-rotating portion of the vehicle for activation by said permanent magnet means when said magnet means is in said second position; and
an alarm system which is turned on when said Hall switch means is activated.

4,330,775

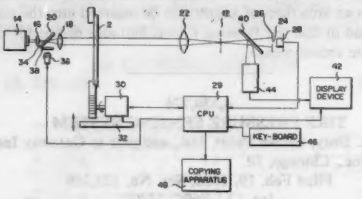
APPARATUS FOR INSPECTING DEFECTS IN A PERIODIC PATTERN

Akito Iwamoto, Kamakura, and Hidekazu Sekizawa, Kawasaki, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Mar. 14, 1980, Ser. No. 130,370
Claims priority, application Japan, Mar. 19, 1979, 54-31020
Int. Cl.³ G01N 21/32
U.S. Cl. 340—146.3 P 11 Claims

1. An apparatus for inspecting defects in a periodic pattern comprising:
a light source for producing a coherent light directed to the periodic pattern to be inspected;
a fourier transformer for Fourier-transforming a light including the information of the periodic pattern and defects; and
filtering means positioned at the backward focal point of the Fourier transformer and having a light block areas for blocking mainly the periodic pattern information component of the light passed the Fourier transformer and a ring-like light transmission area allowing mainly the defects information component of the light to pass there-

through, the light block area including a first light block area of spot like shape which prevents a transmission of the zeroth order diffraction light transmitted through the



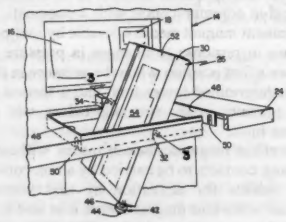
Fourier transformer and a second light block area which is disposed around the first area and prevents a transmission of the first and higher order diffraction light transmitted through the Fourier transformer.

4,330,776

KEYBOARD TYPE OF INPUT CONTROL SYSTEM FOR AN ANALYTICAL INSTRUMENT

Allan G. Dennison, Jr., Acton; Stanley B. Smith, Jr., Westford; Robert A. Fonteyn, Lexington, and Robert V. Jarratt, Jr., Groton, all of Mass., assignors to Instrumentation Laboratory Inc., Lexington, Mass.

Filed Mar. 4, 1980, Ser. No. 127,246
Int. Cl.[3] G06F *3/02*
U.S. Cl. 340—365 R 6 Claims



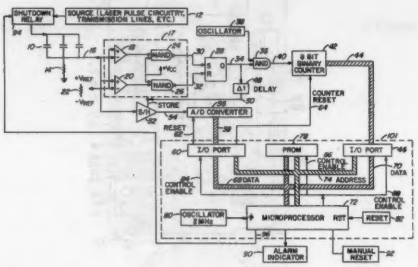
1. An input control system for an analytical instrument that includes a spectroanalysis system having an emission source optically coupled to an analysis unit, comprising a controller that provides outputs to control an analysis sequence of said emission source and said analysis unit, an input control unit coupled to said controller, said input control unit having first and second arrays of keys, said first array of keys including a first set of keys that provides a first group of input control functions that permit an operator to run an analysis sequence provided by said controller for said emission source and said analysis unit, and a second set of keys that provides a second group of input control functions that permit an operator to vary the analysis sequence provided by said controller for said emission source and said analysis unit, said second array of keys providing the same input control functions as said first group of input control functions but not said second group of input control functions such that an operator is permitted to run, but not to vary, an analysis sequence provided by said controller for said emission source and said analysis unit, said second array including a set of keys that duplicate said first set of keys in said first array, and movable means having a first condition in which only said first array of keys is operator accessible and a second condition in which only said second array of keys is operator accessible.

4,330,777

DEVICE FOR DETECTING IMMINENT FAILURE OF HIGH-DIELECTRIC STRESS CAPACITORS

George G. McDuff, Los Alamos, N. Mex., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Nov. 5, 1980, Ser. No. 204,121
Int. Cl.[3] G08B *21/00*
U.S. Cl. 340—635 8 Claims



1. A device for detecting imminent failure of a high-dielectric stress capacitor comprising:

means for applying a variable magnitude current to said capacitor;

means for detecting the pulse width and magnitude of said variable magnitude current;

means for comparing said pulse width and magnitude of said variable magnitude current with an average pulse width and average magnitude for a plurality of current pulses of said variable magnitude current;

means for producing an alarm signal whenever said pulse width varies from said average pulse width by a first predetermined amount;

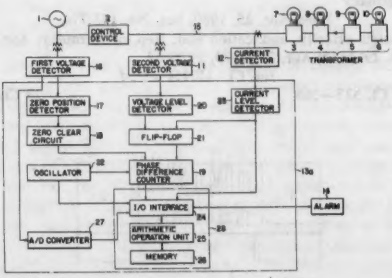
means for producing an alarm signal whenever said magnitude exceeds said average magnitude by a second predetermined amount.

4,330,778

DEVICE FOR DETECTING BROKEN FILAMENTS IN LAMPS

Kazuo Yamazaki, Fuchu; Katsumi Nomura, Hino, and Osafumi Takemoto, Tokyo, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Filed Mar. 4, 1980, Ser. No. 127,053
Claims priority, application Japan, Mar. 13, 1979, 54/28953
Int. Cl.[3] G01R *25/00*
U.S. Cl. 340—642 8 Claims



1. A device for detecting broken filaments of lamps which are connected with secondary windings of transformers respectively provided for said lamps, said transformers having

primary windings connected in series across an AC power source through a power control device of a constant current type including switching elements, said device for detecting broken filaments comprising:

first means for constantly detecting an output voltage of said power control device to be applied across the serially connected transformers, said means producing a first output signal when the detected voltage exceeds a predetermined value;

second means for constantly detecting current delivered from said power control device to said serially connected primary windings of the transformers to produce a second output signal when the detected current exceeds a predetermined value;

third means connected to receive said first output signal and said second output signals for detecting a phase difference between said first output signal and said second output signal;

fourth means for detecting a magnitude of the AC power source voltage; and

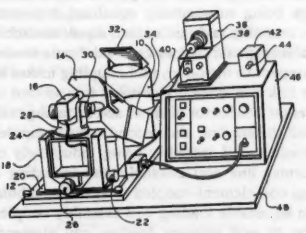
fifth means connected to receive an output voltage of said third means representing the phase difference and an output voltage of said fourth means representing the magnitude of the AC power source voltage for delivering an output signal representing the number of broken filaments of said lamps.

4,330,779

DISPLAY ANALYZER HAVING ANGULAR DEGREES OF FREEDOM

Barry F. Wilensky, and Joseph A. Maggi, both of Brooklyn, N.Y., assignors to The Bendix Corporation, Teterboro, N.J.

Filed Sep. 8, 1980, Ser. No. 184,869
Int. Cl.³ G09G *1/00*
U.S. Cl. 340—705 **16 Claims**



1. A display analyzer for analyzing an image from a unit under test, comprising:

a detection means having a given field of view for producing a viewing signal responsive to the image size and brightness within said field of view, said viewing signal being produced with a predetermined characteristic in response to the appearance of a given image at the center of said field of view;

supporting means for adjustably supporting said detection means, said supporting means having at least two degrees of linear freedom and two degrees of angular freedom, the direction of said given field of view being angularly movable into alignment with said image of said unit under test; and

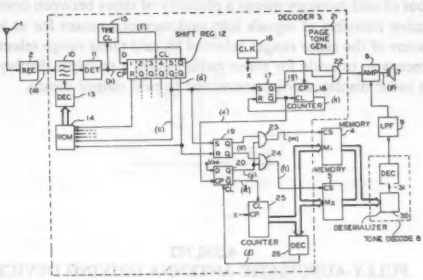
analyzing means connected to said detection means for producing a supporting means adjustment signal, said supporting means being operable to move in response to said adjustment signal, said analyzing means being operable to produce information in response to production of said viewing signal.

4,330,780

RADIO PAGING RECEIVER HAVING PRE-RECORDED VOICE MESSAGES WHICH ARE SELECTED BY ADDRESS CODES AND READ OUT RESPONSIVE TO A SUFFIX CODE

Masaru Masaki, Tokyo, Japan, assignor to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Jan. 3, 1980, Ser. No. 109,307
Claims priority, application Japan, Jan. 10, 1979, 54-2462
Int. Cl.³ G08B *5/22*
U.S. Cl. 340—825.44 **11 Claims**



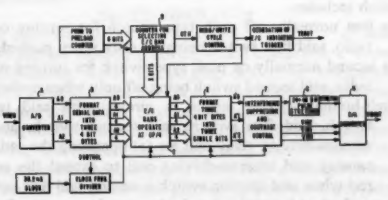
1. A radio paging receiver comprising decoding means responsive to the receipt of successive radio paging signals, at least some of which include a suffix signal for producing a decoded message signal indicating the nature of a desired page; means responsive to one decoded message for sounding an alert tone; memory means for storing a predetermined number of digitalized voice signals representing various pre-recorded vocal comments; means responsive to another decoded message signal for selecting a particular one of said digitalized voice signals stored in said memory means; and means jointly responsive to said selecting means and to a suffix signal received within a predetermined time period after said selection of said one stored voice signals for reading out of said memory means a selected stored digitalized voice signal; and means responsive to a decoded message for both sounding said alert tone and playing back a pre-recorded comment responsive to a read out of a stored digitalized message.

4,330,781

RADAR INDICATORS WITH DIGITAL PROCESSING OF VIDEO SIGNAL

Piercarlo Giustiniani, and Franco Vincentini, both of Rome, Italy, assignors to Selenia Industrie Elettroniche Associate S.p.A., Italy

Filed Jul. 30, 1979, Ser. No. 62,076
Int. Cl.³ G01S *7/06*
U.S. Cl. 343—5 DP **6 Claims**



1. A radar indicator comprising input means for receiving video radar signals, analog-to-digital converter means connected to said input means for converting received video radar signals to digital signals representative thereof; memory means for storing the digital signals from said converter means; out-

put means adapted for connection to a radar display device; and control means, including radar range selection means and display brightness selection means, for controlling the transfer of signals from said converter means into said memory means and the transfer of signals out of said memory means to said output means to cause signals to be transferred into said memory means at a speed dependent upon the radar range selected by said range selection means and to be transferred out of said memory means at a speed dependent upon the display brightness selected by said brightness selection means; said control means further including means for causing transfer of signals out of said memory means a plurality of times between consecutive transfers of signals into said memory means for at least some of the radar ranges selected by said radar range selection means to provide for those radar ranges a multiple display on a radar display device connected to said output means.

4,330,782

FULLY-AUTOMATIC ANTENNA DRIVING DEVICE

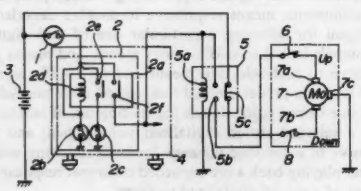
Atsumi Hashimoto, and Kazumasa Takagi, both of Yokohama, Japan, assignors to Nissan Motor Co., Ltd., Japan

Filed Aug. 1, 1980, Ser. No. 174,508

Claims priority, application Japan, Aug. 6, 1979, 54/108328[U]

Int. Cl.³ H01Q 1/32

U.S. Cl. 343—715 **5 Claims**



1. In a fully-automatic antenna driving device for extending and retracting an antenna for a radio in a vehicle of the type which includes an antenna driving circuit operative in response to openings and closings of an ignition switch and a radio switch in series therewith and connected to a source of power, to extend and retract an antenna rod by exciting an antenna-driving relay coil having at least a pair of relay contacts in circuit with a motor for alternately extending or retracting an antenna rod in response to the respective open or closed states of said relay contacts, the improvement wherein said radio switch includes:

a first normally off push type switch for turning on said radio, said first switch being on only when pushed;

a second normally on push type switch for turning off said radio, said second switch being off only when pushed; and

self-holding circuit means in circuit with said ignition switch, said first switch, said second switch, and said antenna-driving relay coil for (a) operating the radio and causing said antenna-driving coil to extend the antenna rod when said ignition switch is on and said first switch is pushed and maintaining such operations even after said first switch is released; (b) causing said antenna driving antenna relay to retract said antenna rod when said second switch is pushed; and (c) deenergizing said antenna driving relay coil when said ignition switch is turned off to retract the antenna rod even if radio is on.

4,330,783

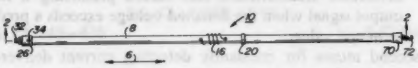
COAXIALLY FED DIPOLE ANTENNA

Michael J. Toia, Box 21, Columbia, Md. 21045

Filed Nov. 23, 1979, Ser. No. 96,738

Int. Cl.³ H01Q 9/16

U.S. Cl. 343—749 **9 Claims**



1. An antenna system comprising:

a first longitudinally extended dipole assembly including a first tubular dipole element, said assembly having a capacitive inductive voltage induced therein, said first dipole assembly including a first center conductor element having an electrical feed point on a first end thereof for introducing electrical power therethrough, said first center conductor element extending throughout said longitudinal extension of said first dipole assembly for exiting at an end section thereof,

a second longitudinally extended dipole assembly including a second tubular dipole element, said second dipole assembly substantially axially aligned with and positionally displaced from said first dipole assembly, said second dipole assembly including a second center conductor element contained therein, said second center conductor extending throughout said second longitudinal extension of said second dipole assembly, said second center conductor element being electrically decoupled from said first and second dipole assemblies, said first and second center conductor elements being positionally aligned wherein said inductive voltage in each of said center conductor elements is of substantially equal magnitude and out of phase each with respect to the other, and,

means for electrically coupling said first dipole assembly to said second dipole assembly, said capacitive inductive voltage being substantially equalized between said first dipole assembly and said second dipole assembly for voltage balancing said first and second dipole assemblies each with respect to the other, said coupling means including a center link coil assembly coupled to a second end of said first center conductor element and a loading coil assembly coupled to said first and second tubular dipole elements, said loading coil assembly being inductively coupled to said center link coil assembly and including a primary loading coil element coupled to said first tubular element and an adjustable loading coil assembly coupled in series relation to said primary loading coil element and said second tubular dipole element for adjusting said antenna system to a predetermined resonance frequency.

4,330,784

VARIABLE WAVEGUIDE CONTINUOUS SLOT ANTENNA

Gaylon E. Ryno, and John G. Hoffman, both of Riverside, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Feb. 13, 1967, Ser. No. 616,432

Int. Cl.³ H01Q 13/10

U.S. Cl. 343—771 **5 Claims**

1. A continuous slot antenna having improved radiation pattern, comprising:

(a) a section of rectangular waveguide propagating a TE_{10} mode,

(b) a long continuous curved-slot in one broadface of said waveguide,

(c) said slot being positioned to one side of the waveguide centerline,

(d) the broad dimension of said section of rectangular waveguide being varied along its length for adjusting the phase of energy radiated therefrom.

4,330,785

THERMAL RECORDING METHOD

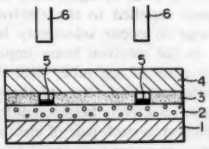
Kenji Yabuta, Funabashi; Senji Tosa; Yasuhiko Oiri, both of Tokyo, and Chihaya Tanaka, Isehara, all of Japan, assignors to Mitsubishi Paper Mills, Ltd. and Nippon Hoso Kyokai, both of Tokyo, Japan

Filed Feb. 18, 1981, Ser. No. 235,721

Claims priority, application Japan, Feb. 19, 1980, 55-19416; Jun. 13, 1980, 55-79938

Int. Cl.³ G01D *15/10, 15/34*

U.S. Cl. 346—1.1 **6 Claims**



1. A thermosensitive stereo recording method in which a thermosensitive stereo recording material prepared by coating the surface of a support with a layer principally composed of thermo-expandable microspheres and a thermo-recording medium prepared by forming a thermoplastic ink coating layer on the surface of a substrate are attached to each other such that their respective coating layers oppose to each other, then, if necessary, after press-bonding them integrally to each other by using a press roll device such as a calender or laminator, said thermoplastic ink coating layer is transferred onto the coating layer of said thermosensitive stereo recording material by a thermal recording device, and after stripping off said thermo-recording medium, the entire surface of the coating layer of said thermosensitive stereo recording material is exposed by an exposure means to thereby obtain a concavo-convex image.

4,330,786

METHOD OF CONTROLLING THERMALLY CONTROLLING A THERMAL PRINTING HEAD

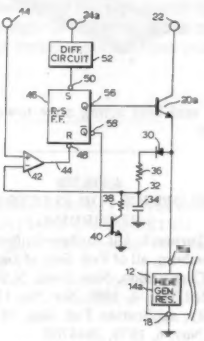
Etsuo Hatabe; Masatoshi Kato; Fumitake Tokugawa, and Toshiharu Nozawa, all of Amagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 17, 1980, Ser. No. 160,571

Claims priority, application Japan, Jun. 18, 1979, 54-77245

Int. Cl.³ G01D *15/10;* **H05B** *1/02;* **G05D** *23/00*

U.S. Cl. 346—76 PH **4 Claims**



1. A method of controlling a thermal printing head having a plurality of heat generating resistors disposed in a predetermined pattern and driven by respective driving circuits for causing currents to flow through said heat generating resistors in accordance with associated image signals to generate heat therefrom for recording an image on a section of thermally sensitive paper corresponding to said image signals, which method comprises the steps of:

electrically simulating the change of the temperature of each of said heat generating resistors with respect to time by means of a change in an electrical parameter with respect to time; and

controlling the current flowing through each of said heat generating resistors for terminating current flow through the respective heat generating resistors when said electrical parameter reaches a level corresponding to a predetermined level of said temperature.

4,330,787

LIQUID JET RECORDING DEVICE

Yasushi Sato, Kawasaki; Yasushi Takatori, Machida; Toshitami Hara, Tokyo, and Yoshiaki Shirato, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 15, 1979, Ser. No. 84,748

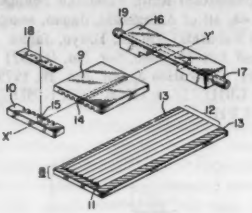
Claims priority, application Japan, Oct. 31, 1978, 53-133887; Oct. 31, 1978, 53-133888; Oct. 31, 1978, 53-133889; Dec. 28, 1978, 53-165843

Int. Cl.³ G01D *15/16*

U.S. Cl. 346—140 R **2 Claims**

1. A liquid jet recording device which comprises: a recording head having liquid discharging orifice for discharging liquid in a predetermined direction, a heat generating member, a heat acting zone where heat energy generated from the heat generating member acts on the liquid, and liquid feeding path for feeding the liquid to the heat acting zone, wherein said recording head is constructed, at least, with a heat generating base plate, on which the heat generating member is provided; a liquid feeding path plate, and a liquid discharging path plate, on each of which a multitude of fine grooves to provide the liquid discharging orifice, liquid feeding path, and heat acting zone are provided; and drive signal feeding means for generating drive signals to drive said heat generating member to discharge the liquid in the predetermined direction, wherein the

direction of the liquid flowing into said heat acting zone from said liquid feeding path differs from the direction of the liquid



flowing out of said heat acting zone toward said liquid discharging orifice.

4,330,788

PRINTING DEVICE FOR ELECTROPHORETIC RECORDING

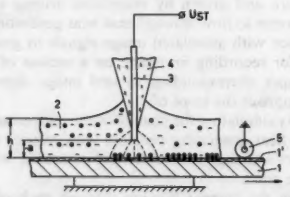
Hans D. Hinz, Tornesch; Ulf Rothgordt, Norderstedt, and Herbert Löbl, Hamburg, all of Fed. Rep. of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 4, 1980, Ser. No. 126,940

Claims priority, application Fed. Rep. of Germany, Mar. 5, 1979, 2908446; Nov. 6, 1979, 2944708

Int. Cl.³ G01D *15/06;* **B01D** *13/02;* **C25D** *1/12;* **G03G** *15/00*

U.S. Cl. 346—157 **15 Claims**



1. A printing device using electrophoretic recording comprising:

a movable image carrier having an electrically conductive surface,

at least one electrode relatively movable with respect to said image carrier and separated by distance a from said image carrier,

means for continuously supplying developer fluid containing electrophoretic pigment particles to a depth h greater than said distance a on said image carrier at least adjacent to said electrode for wetting said at least one electrode,

means for applying an electric field between said image carrier and said at least one electrode, and

means for removing depleted developer fluid from said image carrier.

4,330,789

ELECTROSTATIC PRINTING APPARATUS INCLUDING AN ELECTRON BEAM TUBE

Maurice R. Bennett, Marple, England, assignor to Thorn EMI Limited, London, England

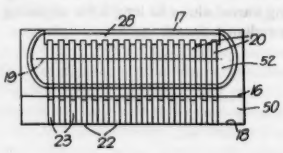
Filed Mar. 5, 1980, Ser. No. 127,528

Claims priority, application United Kingdom, Mar. 6, 1979, 7907912

Int. Cl.³ G01D *15/06;* **H01J** *31/02, 9/00*

U.S. Cl. 346—161 **12 Claims**

1. An electrostatic printer including an electron beam tube assembly having an electron beam tube with a tube envelope and having a pattern of a plurality of discrete conductors at least partially provided by being deposited on one surface of an initially separate face plate of the tube envelope, the conductor bearing surface of the face plate being secured to the remainder of the tube envelope, the conductors to extend from within the envelope of the electron beam tube at least to an edge of the face plate spaced from the remainder of the envelope, there being an array of exposed, spaced apart ends of the conductors beyond the remainder of the envelope, each conductor providing only one such exposed end, and each conductor is coupled to a point to be maintained at a high positive predetermined potential level, with respect to the cathode, by being coupled, via resistive material also deposited on the tube envelope, to a conductive coating provided on the remainder of the tube envelope and to be maintained at the predetermined potential level, each exposed end of a conductor individually comprising one electrode of a pair of electrodes, there being a plurality of pairs of electrodes, with the exposed ends of different conductors being in different pairs of electrodes, and another, common electrode is provided for the different pairs of electrodes, the electrodes of each pair of electrodes are at least substantially uniformly spaced apart, and means is provided within the electron beam tube assembly to move an associated sheet of material sensitive to electrical discharges between each of the different pairs of electrodes, and the arrangement is such that the potential level of a conductor is changed from said predetermined potential level by the electron beam impinging thereon, and each such change in the potential level of a conductor causes an electrical discharge to occur between the pair of electrodes having as one electrode the exposed end of the conductor upon which the electron beam is impinging, such electrical discharges to occur between different pairs of electrodes to mark different parts of different adjacent portions of the moving sheet, and the electron beam tube assembly includes a source of information signals connected to the electron beam tube in operation, with the sheet moving between each of the different pairs of electrodes, and in response to information signals supplied to the electron beam tube, an electrical discharge to occur selectively between a pair of electrodes, and as the electron beam impinges on different parts of the face plate of the tube, with the electron beam impinging on different conductors of the pattern, electrical discharges to occur selectively between different pairs of electrodes, and in relation to each pair of electrodes individually, electrical discharges to occur between the pair of electrodes at different times, providing marks on the different corresponding parts of the different instantaneous adjacent portions of the moving sheet, the marks so provided on the sheet providing desired representations of the information signals supplied to the assembly.



4,330,790

TAPE OPERATED SEMICONDUCTOR DEVICE PACKAGING

Carmen D. Burns, San Jose, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.

Filed Mar. 24, 1980, Ser. No. 133,040

Int. Cl.³ H01L *29/00;* **H01R** *43/02*

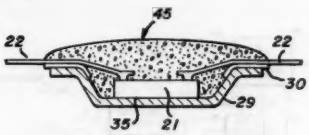
U.S. Cl. 357—70 **10 Claims**

1. A process for encapsulating a semiconductor device that is attached to a transport tape, said tape having a succession of metal finger patterns with each pattern including a central

portion where the tips of said fingers conform to the bonding pads of said semiconductor device and are bonded thereto, said process comprising the steps:

forming a metal cup, having a recess with a diameter that exceeds the size of said semiconductor device and a flat peripheral edge;

forming a first insulating film into a ring shape, having an outer diameter slightly greater than the outer diameter of



said cup, and an inner diameter greater than the diameter of said semiconductor device;

bonding said first insulating film between said flat edge of said cup and said fingers on said tape;

bonding said semiconductor device to the bottom of said recess in said cup and attaching said fingers by way of said first film to said cup; and

encapsulating said semiconductor device inside said cup.

4,330,791

SYSTEM FOR PROCESSING TELEVISION VIDEO SIGNALS REPRODUCED FROM A RECORDING MEDIUM IN SPECIAL REPRODUCTION MODE INTO SIGNALS FOR PERFORMING NORMAL INTERLACING

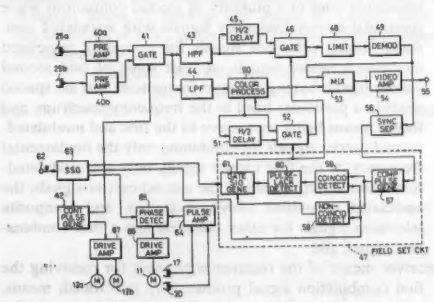
Terumi Ohara, Yokohama; Yoshio Mizuno, Kamakura; Yoshitaka Iwabuchi, Yamato, and Kenzi Oketani, Yokohama, all of Japan, assignors to Victor Company of Japan, Ltd., Yokohama, Japan

Filed Jul. 9, 1979, Ser. No. 56,080

Claims priority, application Japan, Jul. 10, 1978, 53-83786

Int. Cl.³ H04N 5/795

U.S. Cl. 358—8 **5 Claims**



1. A reproducing system in an apparatus having one head for recording and reproducing a television signal on and from a rotating recording medium, with one field recorded on each track on the medium, said system comprising:

means for delaying a signal reproduced from a track by a period equal to one half of one horizontal scanning period of the television signal;

gate means for selectively passing a reproduced signal from the delaying means and a reproduced signal which has not passed through the delaying means;

means for separating a horizontal synchronizing signal from the signal passed by the gate means;

means for supplying a standard reference signal;

phase detection means for comparing the phase of the separated horizontal synchronizing signal with the phase of the standard reference signal and detecting a coincidence or non-coincidence of the two phases in order to produce a corresponding detection output signal; and

gate signal forming means responsive to the detection output signal of the phase detection means for forming a gate signal for controlling the gate means upon non-coincidence detection, the reproduced signal from the delaying means passing through the gate means during substantially a video signal period of a field during which the non-coincidence is detected, and the reproduced signal which has not passed through the delaying means passing through the gate means during a period when coincidence is detected.

4,330,792

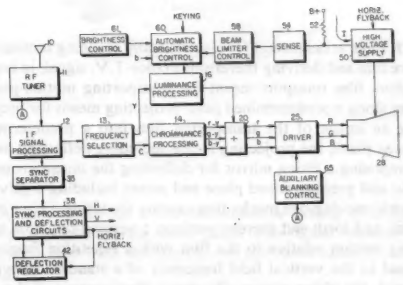
VIDEO BLANKING CIRCUIT WITH CONTROLLED RATE OF UNBLANKING

Saiprasad V. Naimpally, Indianapolis, Ind., assignor to RCA Corporation, New York, N.Y.

Filed Nov. 26, 1980, Ser. No. 210,839

Int. Cl.³ H04N 9/535

U.S. Cl. 358—33 **6 Claims**



1. In a color television receiver including a video signal processing channel for providing plural color image representative video signals; a kinescope for providing a picture display in response to said color signals; plural video output stages for respectively supplying said plural color signals to said kinescope; means for automatically limiting excessive beam currents conducted by said kinescope; input frequency selective tuning means including an adjustable channel selector operated during channel changing intervals for selectably tuning said receiver; switch means coupled to a source of potential, and exhibiting a first switching state during said channel changing intervals and a second switching state at other times; and apparatus comprising:

a source of reference bias potential coupled in common to said plural video output stages and to which video signals processed by said video output stages are normally referenced; and

blanking means coupled to said reference bias source and to said switch means, said blanking means exhibiting (1) a blanking response time for producing a modified reference bias potential during said channel changing intervals so that said video output stages and thereby said kinescope are blanked during said channel changing intervals, and (2) an unblanking response time slower than said blanking response time, for permitting said modified reference bias voltage to gradually return to normal after said channel changing interval ends.

4,330,793

ELECTRONIC SCANNING OF SUPER-8 FILMS FOR REPRODUCTION ON A T.V. VIEWING UNIT

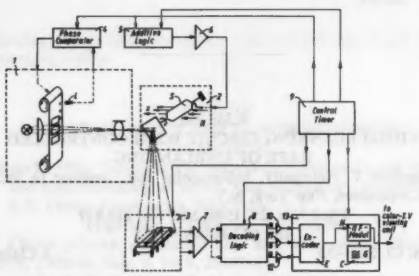
Otto Stemme, Munich; Eduard Wagensonner, Aschheim, and Wolfgang Ruf, Munich, all of Fed. Rep. of Germany, assignors to AGFA-Gevaert Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jul. 11, 1979, Ser. No. 56,789

Claims priority, application Fed. Rep. of Germany, Jul. 17, 1978, 2831296

Int. Cl.³ H04N 9/11, 9/07, 3/08

U.S. Cl. 358—56 11 Claims



1. In an arrangement for electronically scanning motion-picture film and deriving therefrom a color-T.V. signal, in combination, film transport means for transporting motion-picture film along a predetermined path; projecting means for projecting an image of the transported film into a predetermined image plane, the projecting means including deflecting means comprising a tilting mirror for deflecting the image projected into said predetermined plane and means including a galvanometric moving-coil mechanism causing the tilting mirror to tilt back and forth and thereby perform a vertical-direction scanning motion relative to the film with a repetition frequency equal to the vertical field frequency of a standard television signal, the tilting mirror effecting a displacement of the projected image of the film frame relative to said predetermined image plane by an amount corresponding to only a fraction of the length of the film frame, the remainder of the displacement resulting from mere film transport, the displacement of the projected image of the film frame effected by the tilting mirror corresponding to two-thirds of the length of the film frame so that the tilting mirror performs three scanning operations upon each successive film frame; image-sensing means operative for sensing the image in said predetermined image plane, including a single row of photosensitive elements located in said predetermined image plane and extending transverse to that direction within said image plane which corresponds to the film transport direction, the row of photosensitive elements comprising a succession of groups of three photosensitive elements each, the three photosensitive elements of each such group being arranged in a line which extends in the same direction in which the whole row of photosensitive elements extends, the three photosensitive elements of each such group having different respective spectral sensitivities, the three different spectral sensitivities respectively correspond to the wavelengths for a blue component signal, a red component signal, and a green component signal, and bucket-brigade or charge-coupled circuit means receiving the signals produced by the row of photosensitive elements and including register circuit means having a series of stages connected to receive the signals produced by the row of photosensitive elements and means for effecting read-out of the register circuit means.

4,330,794

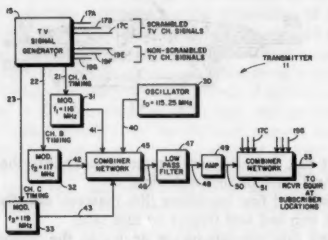
MULTICHANNEL SUBSCRIPTION TELEVISION SYSTEM

Robert A. Sherwood, El Paso, Tex., assignor to GTE Automatic Electric Laboratories, Inc., Northlake, Ill.

Continuation-in-part of Ser. No. 168,623, Dec. 31, 1979. This application Feb. 25, 1980, Ser. No. 124,498

Int. Cl.³ H04N 7/16

U.S. Cl. 358—120 10 Claims



1. In a multi-channel television system utilizing suppression of horizontal synchronization and associated horizontal blanking pulses for scrambling a plurality of composite television channel signals for associated ones of a plurality of television channels in the system, apparatus for providing a timing signal in receiver equipment for a subscriber location for use in descrambling a selected scrambled composite television signal, comprising:

transmitter means comprising first means generating a first continuous wave sinusoidal carrier frequency signal having a frequency fo; second means generating a plurality of sinusoidal timing reference signals for associated scrambled television signals, each timing reference signal having a different phase (defined by zero crossings thereof) related to that of, and delayed in time with respect to, suppressed synchronization pulses in the associated scrambled television signal; third means frequency modulating associated ones of a plurality of second continuous wave sinusoidal carrier frequency signals with associated sinusoidal timing reference signals for providing associated modulated carrier signals, at least some of said second carrier signals having different frequencies that are spaced apart in a particular band in the frequency spectrum; and fourth means being repsonsive to the first and modulated-second carrier signals for combining only the fundamental frequency of the first carrier signal, only the modulated-fundamental frequencies of the second carrier signals, the associated scrambled television signals, and composite television signals for other channels into a first combination signal; and

receiver means of the receiver equipment for receiving the first combination signal produced by said fourth means, and comprising fifth means for selecting a particular scrambled television channel for viewing and producing a control signal associated with and identifying the selected channel; sixth means for mixing said first carrier signal in the first combination signal with the modulated carrier signal for the selected channel signal in the first combination signal for producing an intermediate frequency (IF) signal for the selected channel modulated with the associated timing reference signal; seventh means responsive to said control signal for demodulating the modulated IF signal associated with the selected television channel for reproducing an associated sinusoidal timing reference signal carrying timing information in zero crossings thereof about timing of suppressed synchronization pulses in the associated television signal.

4,330,795

METHOD OF RECORDING TELEVISION SIGNALS

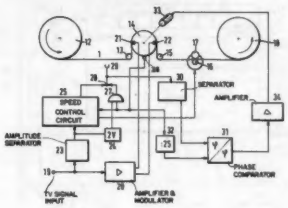
Hubert Foerster, Darmstadt-Eberstadt, and Josef Sochor, Dieburg, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Aug. 27, 1980, Ser. No. 181,673

Claims priority, application Fed. Rep. of Germany, Sep. 3, 1979, 2935574

Int. Cl.³ H04N 5/76

U.S. Cl. 358—127 4 Claims



1. In a method of recording a television signal in which the television signal is recorded on a relatively slowly moving tape (1) in a plurality of tracks extending at an angle to the longitudinal direction of the tape by a plurality of recording heads (21, 22) carried at the periphery of a head wheel (14) which rotates at a relatively high speed, the improvement comprising the steps of

controlling rotation of the head wheel to execute m complete revolutions for each n complete television pictures, wherein the ratio m/n is not an integer;

and recording control signals having a repetition frequency equal to 1/n of the complete picture frequency on a control track by a fixed recording head (29).

4,330,796

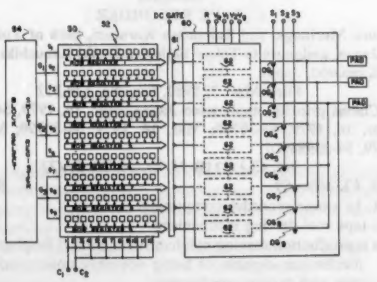
BLOCK READABLE CHARGE COUPLED DEVICE

Constantine N. Anagnostopoulos, Mendon; Teh-Hsuang Lee, Webster; Bruce C. Burkey, and James P. Lavine, both of Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jan. 30, 1980, Ser. No. 116,686

Int. Cl.³ H04N 3/14

U.S. Cl. 358—213 17 Claims



1. Block readable area image sensor apparatus of the charge coupled interline transfer type comprising:

(a) a plurality of side by side photosite row structures, each of which has (1) a row of photosites for accumulating signal charge in response to incident radiation, (2) a row register proximately disposed in relation to said row of photosites, and (3) a selectively actuable photogate for effecting charge transfer from said photosites to said row register;

(b) means for applying clocking signals to said row registers for reading out charge therein; and

(c) means for electrically connecting predetermined pluralities of said photogates to form blocks of interconnected photosite row structures so that the photogates of all the photosite row structures in a block are simultaneously actuable, said means for applying clocking signals being effective for reading out charge simultaneously from at least all the row registers in a selectively actuated block.

4,330,797

VIEW-FINDER FOR TELEVISION CAMERA

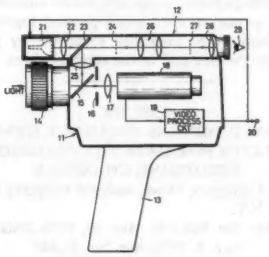
Sumio Yokokawa; Itsuo Takanashi; Tadayoshi Miyoshi; Shintaro Nakagaki, al of Yokohama; Koichiro Motoyama, Ninomiya, and Kenichi Miyazaki, Sagamihara, all of Japan, assignors to Victor Company of Japan, Ltd., Yokohama, Japan

Filed May 28, 1980, Ser. No. 153,937

Claims priority, application Japan, May 29, 1979, 54-71339[U]; May 29, 1979, 54-71340

Int. Cl.³ H04N 5/30

U.S. Cl. 358—224 9 Claims



1. A view-finder for a television camera having an image pick-up means for picking up an image of an object responsive to incident light from the object, said television camera comprising

a lens system through which the incident light from the object advances to the image pick-up means and means for diverging a part of a light advancing through the lens system,

said view-finder comprising: a monochrome television picture receiving means which is supplied with an output signal of the image pick-up means and displays a monochrome picture image; and means for composing the picture image of the monochrome television picture receiving means and an optical color image formed by the light diverged by the diverging means to form an optical image to be observed.

4,330,798

ELECTRONIC STENCIL CUTTER

Arthur J. Heyer, 140 Marengo Ave., Forest Park, Ill. 60130; Edward M. Springer, 8114 S. Kolmar, Chicago, Ill. 60652, and Wallace C. Clay, 20 Yorkshire Woods, Oakbrook, Ill. 60521

Division of Ser. No. 894,528, Apr. 10, 1978. This application Sep. 20, 1979, Ser. No. 77,160

Int. Cl.³ H04N 1/08

U.S. Cl. 358—291 12 Claims

1. Apparatus for holding an original subject sheet or the like about the cylindrical surface of a drum on an electronic stencil cutter comprising:

a backing sheet wrapped about the drum;

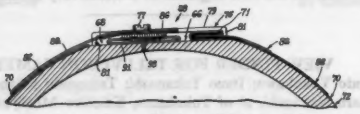
a flexible, transparent retainer sheet wrapped about the drum exteriorly of the backing sheet and adapted temporarily to

retain an original subject sheet on the backing sheet in a scannable position beneath the retainer sheet;

said retainer sheet having a fixed end fastened to the surface of the drum;

clamp means gripping said fixed end of said retainer sheet extending substantially parallel to the axis of the drum;

fastening means attaching said clamp means to the drum, said fastening means including means enabling limited angular adjustment of said clamp means relative to the axis of the drum in response to tensioning the retainer sheet



about the drum to enable wrinkle-free disposition of said retainer sheet about the drum; and

said retainer sheet having a free end opposite said fixed end, a fastener strip attached to said free end of the retainer sheet and attachable to a fastener strip fixed to the drum, said fastener strips being provided on their facing surfaces with interengageable loops and hooks enabling the strips to cling to one another when pressed together and enabling them to be manually separable by pulling outwardly on the free end of the retainer sheet.

4,330,799

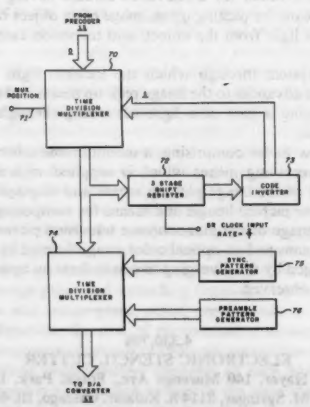
INTERLEAVED DIPULSE SEQUENCE GENERATING APPARATUS FOR DATA TRANSMISSION OR RECORDING CHANNELS

Robert Price, Lexington, Mass., assignor to Sperry Corporation, New York, N.Y.

Division of Ser. No. 888,130, Mar. 20, 1978. This application Nov. 5, 1979, Ser. No. 91,449

Int. Cl.³ G11B *5/09*

U.S. Cl. 360—40 **7 Claims**



1. In a data transmission or recording channel having a source of data pulse signals, interleaved dipulse sequence generating apparatus comprising

means for decomposing each said data pulse into a pair of spaced apart subpulses thereby generating a dipulse,

means for interleaving said dipulses without interference therebetween to provide an interleaved dipulse sequence signal in accordance with said data pulse signals, and

means for conveying said interleaved dipulse sequence signal on said channel.

4,330,800

DATA DELETION DEVICE FOR MAGNETIC TAPES

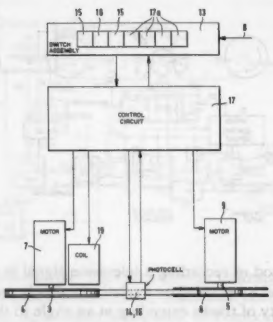
Lothar Nikelat, Lannerstr. 26, D-4050 Monchen-Gladbach 4, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 18,714, Mar. 8, 1979, abandoned. This application Jul. 10, 1980, Ser. No. 168,203

Claims priority, application Fed. Rep. of Germany, Mar. 8, 1978, 2809992

Int. Cl.³ G11B *5/47, 15/48*

U.S. Cl. 360—66 **10 Claims**



1. A data deletion device for magnetic tapes, in particular computer tapes, and wherein said magnetic tape includes a reflector marking located on said tape, said device comprising a supply reel and a take-up reel each provided with a separate drive, data deletion means comprising a coil disposed adjacent to and transversely to the plane of said supply reel, a guiding device for guiding tape along a tape path from said supply reel to said take-up reel, a reflector marking recognizing device for recognizing said reflector marking on said tape, said reflector marking recognizing device being provided in the tape path and said reflector marking recognizing device generating a switching signal in response to detection of said reflector marking on said tape to set a device by means of which said coil is energized, said coil thus being energized no earlier than upon detection of said reflector marking, and said data deletion device having a switching device by means of which the coil is switched off no earlier than after one further revolution of said supply reel containing said tape to be deleted, said one further revolution being further to the energizing of said coil.

4,330,801

TAPE RECORDER

Kaoru Morinaga, and Takamasa Kurafuzi, both of Yokohama, Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Mar. 7, 1980, Ser. No. 128,312

Claims priority, application Japan, Mar. 16, 1979, 54-30787; Mar. 16, 1979, 54-30789; Mar. 16, 1979, 54-30790; Mar. 16, 1979, 54-33986[U]

Int. Cl.³ G11B *15/44, 19/26, 27/22*

U.S. Cl. 360—69 **8 Claims**

1. In a tape recorder comprising:

a tape reel driving mechanism;

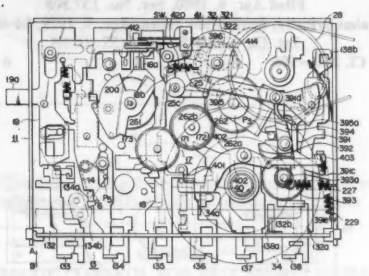
a reproduction driving mechanism and a fast feeding driving mechanism capable of being operably connected to said tape reel driving mechanism;

a reproduction operation member and a fast feeding operation member which respectively operate said reproduction driving mechanism and said fast feeding driving mechanism and which are displaceable from inoperable positions to operable positions for performing a reproducing operation and a fast feeding operation;

a locking mechanism for locking both of said operation members at operable positions;

a tape travel mechanism for facilitating tape travel;

a switching assembly displaceable between a first position to render said fast feeding driving mechanism operable and said reproduction driving mechanism inoperable and a second position to render said fast feeding driving mechanism inoperable and said reproduction driving mechanism operable;



a rotary body for operably connecting with said switching member so as to perform said displacement of said switching member by its torque and to rotate independently of the tape travel; and

an operating mechanism for automatically displacing said switching assembly in response to predetermined conditions in cooperation with said rotary body.

4,330,802

MAGNETIC CASSETTE TAPE RECORD AND PLAY APPARATUS

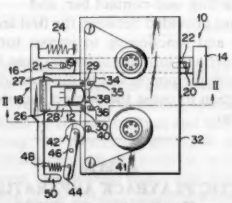
Toshikazu Kato; Sinichi Saitou; Seizo Watanabe, all of Hachioji; Toyoo Nishiyama, Musashimurayama; Misao Shimdda, Hamura; Tutomu Shibata, Hachioji; Kenji Kimura, Tachikawa, and Ken Satoh, Akikawa, all of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Mar. 18, 1980, Ser. No. 131,105

Claims priority, application Japan, Apr. 2, 1979, 54-39514

Int. Cl.[3] G11B *5/008, 15/60*

U.S. Cl. 360—96.6 **8 Claims**



1. A magnetic cassette tape recording and playing apparatus for use with a tape cassette containing tape, a pressure pad and a pad spring on which the pressure pad is mounted, the apparatus comprising:

operation means provided with an operation button for setting the operation mode of the apparatus;

a fixed magnetic head capable of abutting against the pressure pad of the pad spring received in a tape cassette; and

a push member cooperatively coupled with said operation means such that when a tape cassette is loaded or ejected while the apparatus is in the stop mode, said push member is pressed against the pad spring via the tape in the tape cassette to deform the pad spring inwardly of the tape cassette against the urging force of the pad spring, thereby moving the tape in the cassette to a position untouched by the magnetic head, and, when a tape cassette is loaded or ejected when the operation button is set for setting the apparatus in the recording or reproduction mode, said push member is removed by said operation means from the pad spring, thereby causing the pressure pad to be pressed, by the pad spring, against the fixed magnetic head with the cassette tape disposed between the pressure pad and magnetic head.

4,330,803

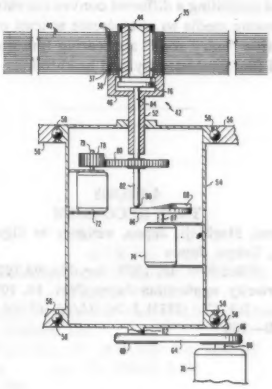
DISK ACCESSING APPARATUS AND METHOD

Kenneth N. Karol, Tucson, Ariz., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 6, 1979, Ser. No. 64,274

Int. Cl.[3] G11B *5/82, 25/04*

U.S. Cl. 360—99 **62 Claims**



1. In a storage device having a spindle axially-slideably mounting for rotation a plurality of co-axially positioned, centrally apertured, co-rotating and relatively axially movable disks, an apparatus co-rotatable with and mounting said disks for rotation and for creating an access space between two adjacent rotating disks by axial slideable movement of at least one selected risk relative to an adjacent disk, said apparatus comprising actuator means being axially and rotationally relatively moveable with respect to said co-rotating disks while co-rotating therewith and having at least a plurality of mechanical disk contactors axially aligned with said central apertures, and receivable within said central apertures of said co-rotating disks with said mechanical contactors, upon predetermined movement of said actuator means, being operative to mechanically contact a selected one of said disks adjacent its said central aperture, as determined by the circumferential orientation of said actuator means with respect to said co-rotating disks, to thereby effect axial movement of said selected disk away from an adjacent disk.

4,330,804

FLYING HEAD WITH FOIL SUPPORT

Dean DeMoss, Camarillo, Calif., assignor to Burroughs Corporation, Detroit, Mich.

Continuation-in-part of Ser. No. 48,701, Jun. 15, 1979, abandoned. This application Aug. 6, 1979, Ser. No. 63,755

The portion of the term of this patent subsequent to Jul. 31, 1996, has been disclaimed.

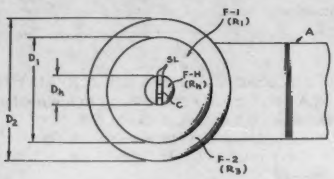
Int. Cl.[3] G11B *5/60, 15/64, 17/32*

U.S. Cl. 360—102 **11 Claims**

1. In a combined transducer-stabilizer array adapted for stabilizing and transducing passing flexible media, the combination including transducer structure disposed in a prescribed head-foil of given curvature and adapted to mount a transducer structure and to be presented in convex, "air-bearing generat-

ing" relation with said passing media, the improvement therewith comprising:

at least one rigidly-fixed mounting foil about the head foil, each foil being arranged and adapted to support the head-



foil and exhibiting a different convex curvature relative to said passing media so as to create at least one prescribed respective "entry zone" air bearing film upstream of the related film generated by said head-foil.

4,330,805

TAPE RECORDER

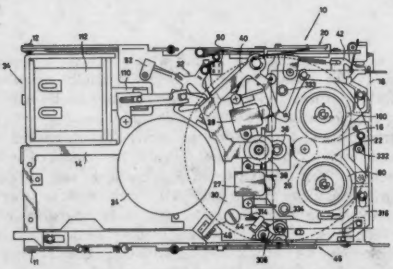
Akira Osanai, Hachioji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Nov. 16, 1979, Ser. No. 94,792

Claims priority, application Japan, Nov. 16, 1978, 53-141617

Int. Cl.³ G11B *5/54, 21/22, 15/44*

U.S. Cl. 360—105 **14 Claims**



1. A tape recorder which comprises:

a pinch roller-supporting board rotatable about a rotation center and one end of which carries a pinch roller;

a capstan shaft;

a rotatable tape FF lever for actuating an FF motor switch to carry out fast forward or rewind run of a cassette tape, regardless of the direction in which the tape FF lever is rotated from a neutral position, the tape FF lever being provided with an engagement member which is engaged with the pinch roller-supporting board for its rotation regardless of the rotating direction of the tape FF lever, thereby retracting the pinch roller from a position in which the pinch roller clamps a cassette tape with the aid of the capstan shaft; the tape FF lever being locked in the rotated position by engagement between the pinch roller-supporting board and the engagement member, and urging means for urging the pinch roller-supporting board about the rotation center, and which, when the engagement member of the tape FF lever is engaged with the pinch roller-supporting board, lock the tape FF lever in the rotated position.

4,330,806

TRANSDUCER FEEDING MECHANISM IN AN APPARATUS FOR RECORDING AND REPRODUCING A SIGNAL ON AND FROM A ROTARY RECORDING MEDIUM

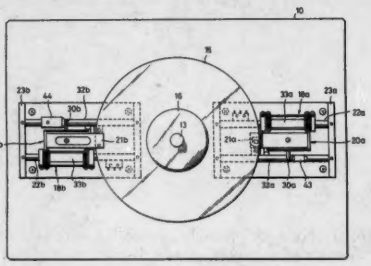
Yoshitaka Iwabuchi, Yamato, and Masao Nozaki, Kawasaki, both of Japan, assignors to Victor Company of Japan, Ltd., Yokohama, Japan

Filed Apr. 4, 1980, Ser. No. 137,508

Claims priority, application Japan, Apr. 5, 1979, 54-40316

Int. Cl.³ G11B *5/012, 5/55, 21/08*

U.S. Cl. 360—106 **6 Claims**



1. A transducer feeding mechanism in an apparatus for recording and reproducing a signal on and from a rotary recording medium by means of a transducer fed over the recording medium in the radial direction thereof, said mechanism comprising:

a rotational motive power source having a rotary shaft and a pinion provided on the shaft;

a rack meshed with said pinion and fed in translational movement by the rotation of the pinion;

a single guide bar extending in the direction of feeding of the transducer;

a first feeding carriage on which the rack is mounted, and which is guided by said guide bar;

a second feeding carriage on which the transducer is mounted, and which is guided by said guide bar;

a contact bar extending in substantially parallel with the guide bar;

a contact member mounted on the second feeding carriage and contacting said contact bar; and

biasing means provided between the first and second feeding carriages and functioning to impart torques to the first feeding carriage in a direction to cause the rack to mesh further with the pinion and to the second feeding carriage in a direction to cause the contact member to contact the contact bar.

4,330,807

MAGNETIC PLAYBACK APPARATUS HAVING IMMUNITY TO SKEW

James U. Lemke, Del Mar, Calif., assignor to Spin Physics, Inc., San Diego, Calif.

Filed Jun. 26, 1980, Ser. No. 163,248

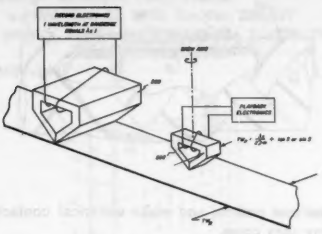
Int. Cl.³ G11B *5/25;* H04N *5/78*

U.S. Cl. 360—119 **8 Claims**

1. In apparatus for playing back a band of signals recorded in a track on magnetic recording medium, and which band of signals includes signal wavelengths as short as, but not shorter than, a given wavelength, said apparatus having a magnetic playback head cooperative with said medium for receiving flux corresponding to the signals in said band of signals recorded in said medium, and wherein, while playing back said band of signals, the maximum relative skew that can occur between said head and said track is approximately of a certain predetermined angle,

the improvement wherein said magnetic head has a width

that is less than about one half said given wavelength divided by the tangent of said predetermined angle,



whereby said head will be immune to head azimuth error in its playback of said signals in said band of signals.

4,330,808

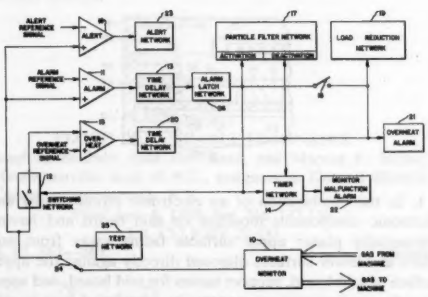
AUTOMATIC CONTROL FOR PROCESSING SIGNALS FROM AN OVERHEAT MONITOR OF A DYNAMOELECTRIC MACHINE

Fred H. Sawada; Sterling C. Barton; Federico S. Echeverria, all of Scotia, and Chester C. Carson, Ballston Spa, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Continuation-in-part of Ser. No. 820,608, Aug. 1, 1977, abandoned. This application Feb. 14, 1979, Ser. No. 12,073

Int. Cl.[3] H02H *5/04, 7/08*

U.S. Cl. 361—25 6 Claims



1. In combination with an overheat monitor for a gas-cooled dynamoelectric machine carrying an electrical load, the monitor responding to overheating by detecting submicron pyrolysis particles entrained in the gas coolant and including a filter capable of removing the submicron pyrolysis particles from the gas coolant passing through the monitor, a control system to verify an apparent overheating signal and to initiate action based on the validity of the signal, said control system comprising:

an alarm network providing an output signal in response to an apparent overheating signal from said overheat monitor;

a particle filter network for initiating filtration of cooling gas passing through said overheat monitor in response to the output signal of said alarm network;

an overheat network providing an output signal in response to loss of the apparent overheating signal following initiation of filtration, the output signal of said overheat network being indicative of a valid overheating signal;

switching means to connect said overheating signal to said overheat network, said switching means being activated by the output signal from said alarm network so that said overheat network becomes responsive to said overheating signal following a first response by said alarm network;

a timer network having a first input for receiving the output signal from said alarm network and a second input for receiving the output signal from said overheat network, said timer network providing an output signal indicative of overheating signal invalidity upon expiration of a preselected time period, said time period being initiated in response to the output signal of said alarm network and terminated prior to expiration in response to the output signal of said overheat network;

a monitor malfunction network adapted to provide an alarm in response to said timer network output, said alarm being indicative of a malfunction in said overheat monitor; and

a load reduction network for initiating a load reduction on said dynamoelectric machine in response to a valid overheating signal as indicated by the output signal of said overheat network.

4,330,809

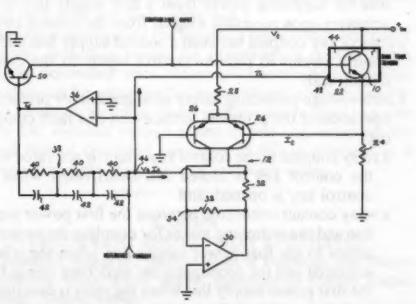
THERMAL PROTECTION CIRCUIT FOR THE DIE OF A TRANSISTOR

Gerald R. Stanley, Mishawaka, Ind., assignor to Crown International, Inc., Elkhart, Ind.

Filed Dec. 31, 1979, Ser. No. 108,585

Int. Cl.[3] H02H *5/04*

U.S. Cl. 361—103 7 Claims

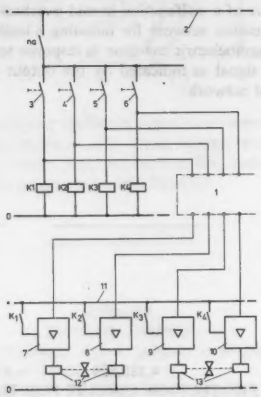


1. A thermal protection circuit for a die of a transistor having a heat sink, said circuit comprising means for multiplying a signal proportional to the dissipative input current to said transistor by a signal proportional to the dissipative applied voltage of the transistor to produce a signal representative of the applied power to the transistor, means responsive to said representative applied power signal for simulating the differential in temperature between said die and heat sink, means for substantially simultaneously determining the temperature of said heat sink, means for summing said heat sink temperature and said differential in temperature between said die and heat sink to determine a sensed die temperature, and means for reducing said applied power to the transistor in response to said sensed die temperature, said multiplying means including a differential pair of transistors having common emitter junctions, resistance means for applying an input current to said common emitter junctions proportional to said dissipative applied voltage of the transistor.

4,330,810
SAFETY SWITCHING DEVICE

Franz Schneider, and Helmut Braitinger, both of Göppingen, Fed. Rep. of Germany, assignors to L. Schuler GmbH, Göppingen, Fed. Rep. of Germany

Filed Apr. 18, 1980, Ser. No. 141,571
Claims priority, application Fed. Rep. of Germany, Apr. 18, 1979, 2915589
Int. Cl.³ H01H 47/00
U.S. Cl. 361—189 6 Claims



2. An automated system for controlling a controlled element comprising:

a control circuit;

one or more actuators coupled to the controlled element;

switch means for coupling the control circuit to the actuators for supplying power from a first supply line to the actuators upon receiving a signal from the control circuit;

a control key coupled between a second supply line and the control circuit to provide control inputs to the control circuit; and

a zero-voltage-protecting safety arrangement for preventing operation of the actuators in the event of a fault comprising:

a relay coupled to the control key which is activated when the control key is closed and deactivated when the control key is opened; and

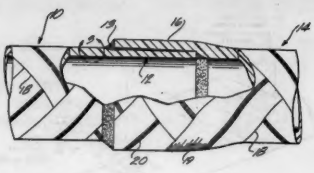
a relay contact connected between the first power supply line and the switching means for coupling the switching means to the first power supply line when the relay is activated and for decoupling the switching means from the first power supply line when the relay is deactivated so that operation of the actuators is prevented unless the control key is closed.

4,330,811
FILAMENT-REINFORCED PLASTIC ARTICLE

Dalton W. Bordner, Fullerton, Calif., assignor to Ameron, Inc., Monterey Park, Calif.

Continuation-in-part of Ser. No. 892,737, Apr. 3, 1978, abandoned. This application Sep. 24, 1979, Ser. No. 78,039
Int. Cl.³ H02G 15/08
U.S. Cl. 361—212 16 Claims

1. A filament-reinforced plastic conduit having a relatively low electrical resistivity, the conduit comprising a fluid-impermeable tubular wall made of filaments coated with plastic, a major portion of the filaments being electrically non-conductive, and a minor portion of the filaments being electrically conductive and being distributed substantially uniformly throughout the wall thickness, the filaments being disposed along helical paths wound in opposite directions in successive layers in the tubular wall so each layer contains conductive filaments and so the conductive filaments in adjacent layers

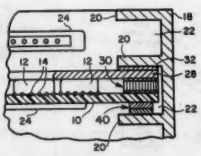


form a crisscross pattern and make electrical contact at the points where they cross.

4,330,812
CIRCUIT BOARD ELECTRONIC COMPONENT COOLING STRUCTURE WITH COMPOSITE SPACER

Kenneth H. Token, St. Charles, Mo., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Aug. 4, 1980, Ser. No. 175,118
Int. Cl.³ H05K 7/20
U.S. Cl. 361—386 5 Claims



1. In the combination of an electronic circuit board and electronic components mounted on said board and having substantially planar upper surfaces facing away from said board and lower surfaces disposed directly against the upper surface of said board, support means for said board, and apparatus for cooling said components by transfer of heat to said support means, the improvement comprising:

thermal conductor means lying in a plane substantially parallel to and spaced above said upper surface of said board, said thermal conductor means comprising an elongated bar-shaped element spanning said board, engaging said upper surfaces of said components and having its end portions overlying the side edge portions of the board;

spacer means disposed between said upper surface of said board and said thermal conductor means, said spacer means comprising an upper skin member, a lower skin member, and a compression resistant filler member disposed between said upper and lower skin members so as to be characterized by a high resistance to compressive forces in directions normal to said upper surface of said board; and

clamp means acting through said board and said spacer means to hold said thermal conductor means in heat transfer relation to said support means;

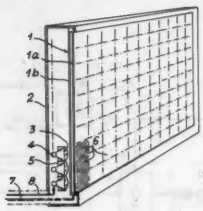
said support means comprising a thermally conductive frame having inwardly directed flanges defining grooves receiving said clamp means, said edge portions of said board, said spacer means, and said end portions of said heat transfer means.

4,330,813

ILLUMINATING DEVICE FOR LARGE SCREEN

Jean-Claude Deutsch, Grenoble, France, assignor to Commissariat a l'Energie Atomique, Paris, France

Filed Nov. 21, 1980, Ser. No. 209,137
Claims priority, application France, Dec. 7, 1979, 79 30064
Int. Cl.³ F21V 5/00
U.S. Cl. 362—244 11 Claims



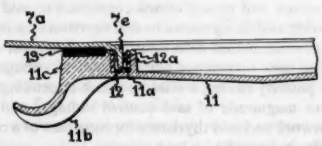
1. An illuminating device for a large single display screen for uniformly illuminating said screen from the rear by means of light arriving at a low angle of incidence θ, said screen having a translucent front face and a transparent rear face between which an electrically sensitized display material is interposed, wherein said device comprises n.p light sources and n.p optical elements in matrix form, the optical elements focusing directly on the screen the light coming from the respective light sources, and means for ensuring that the light beams from each source do not encounter the optical elements associated with the other sources.

4,330,814

FLOOR RELAMPABLE LUMINAIRE

Samuel L. Baldwin, East Flat Rock, and Marcus P. Hogue, Hendersonville, both of N.C., assignors to General Electric Company, Schenectady, N.Y.

Filed Apr. 4, 1980, Ser. No. 137,138
Int. Cl.³ F21V 29/00
U.S. Cl. 362—267 7 Claims



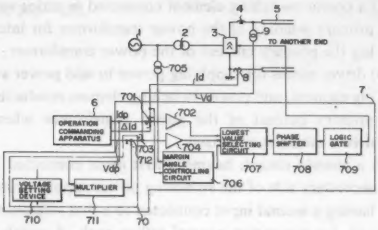
1. A floor-relampable luminaire comprising, in combination, a housing having a botttom and an upper portion adapted to be secured to a support for holding the housing at a substantial height above the floor, said housing having light-transmitting lens means extending substantially across its bottom, said lens means having an aperture therein, means for removably mounting a lamp with its base up in said housing above said aperture, said aperture being sufficiently large so that the lamp is accessible and removable therethrough, light-transmitting closure means hinged to said lens means for movement between a closed position covering said aperture and an open position providing access to the lamp from below said housing, and combined sealing and retaining means on said closure means and said lens means for sealing said closure means on said lens means around said aperture and for detachably holding said closure means in said closed position.

4,330,815

DC TRANSMISSION CONTROL SYSTEM

Hirco Konishi, Katsuta, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed May 1, 1980, Ser. No. 145,741
Int. Cl.³ H02J 3/36
U.S. Cl. 363—35 10 Claims



1. A system for controlling DC power transmission through a DC line connecting the DC terminals of first and second converters having AC terminals for connection to respective AC systems, comprising:

a pair of tapped transformers connected respectively to the AC terminal of said first and second converters;

tap control means provided for each of said tapped transformers for controlling the tap position thereof in such a manner that the no-load voltage on the converter side of the associated transformer is constant;

voltage controller means for controlling the firing angle of said first converter so that the terminal voltage of said first converter is made constant;

current controller means for controlling the firing angle of said second converter so that the DC current in said second converter assumes a predetermined value depending on a detected load value; and

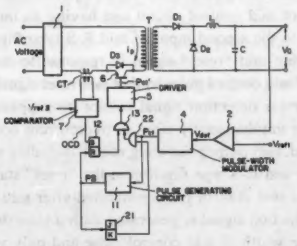
means for compensating the output of said voltage controller means, including means for generating a compensation signal depending upon the magnitude of said load value and means for adjusting the output of said voltage controller means on the basis of said compensation signal to cause the DC terminal voltage of one of said converters to rise and that of the other converter to fall in response to a variation of the magnitude of said load value.

4,330,816

OVERCURRENT PROTECTION APPARATUS

Ryoji Imazeki; Masayuki Hattori, both of Hachioji, and Shigeo Nakamura, Hino, all of Japan, assignors to Fujitsu Fanuc Limited, Tokyo, Japan

Filed Jan. 2, 1980, Ser. No. 109,190
Int. Cl.³ H02H 7/122
U.S. Cl. 363—56 11 Claims



1. An overcurrent protection circuit for a switching power

supply circuit, the switching power supply circuit having a primary side supplied by an alternating current source, a power transformer and a secondary side producing direct current voltage, said overcurrent protection circuit being connected so as to interrupt current in the primary winding of said power transformer, said overcurrent protection circuit comprising:

(a) a power switching element connected in series with the primary winding of the power transformer for interrupting the primary current of the power transformer;

(b) driver means for supplying power to said power switching element, said power switching element conducting the primary current of the power transformer when said driver means is energized;

(c) a control circuit, having a first input connected to the secondary side of the switching power supply circuit and having a second input connected to a first reference voltage, for generating control pulses each of which has a trailing edge which is modulated in width according to variations in the magnitude of the direct current voltage detected on the secondary side of the switching power supply circuit, said control circuit having an output for supplying said control pulses to activate said driver means;

(d) overcurrent detecting means, having an input connected to the primary winding of the power transformer, for generating, as an output, an overcurrent detection signal immediately upon detection of current, in the primary winding of the power transformer, exceeding a predetermined value;

(e) an R-S type flip-flop having a first input connected to the output of said overcurrent detection means to receive a "set" signal from said overcurrent detection means, having a second input, and having an output for supplying a continuous signal when said R-S type flip-flop is in the "reset" state;

(f) a first AND gate, having a first input connected to the output of said R-S type flip-flop, having a second input connected to the output of said control circuit, and having an output connected to said driver means, for turning said driver means on or off by selectively passing or blocking said control pulses, said first AND gate operating to block said control pulse upon detection of an overcurrent condition during the same control pulse in which said overcurrent detection signal is generated by said overcurrent detecting means, said driver means being turned off when said R-S type flip-flop has been placed in the "set" state and said driver means being subject to switching control according to said control pulses when said R-S type flip-flop has been placed in the "reset" state; and

(g) pulse generating means, having an input connected to the output of said control circuit and having an output connected to the second input of said R-S type flip-flop, for generating said "reset" signal in response to the trailing edge of said control pulse so that said reset signal and said overcurrent detection signal cannot be supplied to said flip-flop simultaneously after an overcurrent condition is detected, said pulse generating means including means for placing said R-S type flip-flop in the "reset" state during the next said control pulse generated after said overcurrent detection signal is generated with a time delay of at least the width of said control pulse and only when said control pulse is not being received by said AND gate.

4,330,817

PROCESS AND SYSTEM FOR CONTROLLING THE ENERGIZATION OF A LOAD

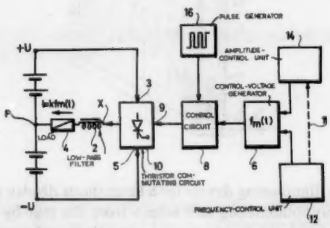
Zoltan Avar, and Lajos Salavetz, both of Budapest, Hungary, assignors to Epitogepgyarto Vallalat, Budapest, Hungary

Continuation of Ser. No. 857,750, Dec. 5, 1977, abandoned. This application Oct. 5, 1979, Ser. No. 82,062

Claims priority, application Hungary, Dec. 6, 1976, EI 718

Int. Cl.³ H02P *13/18;* H02M *5/45*

U.S. Cl. 363—96 **21 Claims**



6. In a converter system for producing an output current generally conforming to a control voltage, comprising a power supply having a pair of terminals balanced with respect to a neutral point, a series-resonant network including a commutating capacitor connected to said neutral point, a first circuit branch including a first main thyristor in antiparallel relationship with a first diode connected to one of said terminals, a second circuit branch including a second main thyristor in antiparallel relationship with a second diode connected to the other of said terminals, a first ancillary thyristor inserted in bucking relationship with said first main thyristor between said series-resonant network and a junction of said branches, a second ancillary thyristor antiparallel to said first ancillary thyristor inserted in bucking relationship with said second main thyristor between said series-resonant network and said junction, a generator of clock pulses establishing a sequence of recurrence periods of predetermined duration, a source of firing pulses having a cadence substantially higher than that of said clock pulses, and timing means connected to said source for transmitting said firing pulses to said thyristors during parts of each recurrence period determined by said control voltage to generate in each recurrence period a pair of voltage pulses of opposite polarity having a relative width depending on the instantaneous magnitude of said control voltage, said series-resonant network and said thyristors forming part of a commutation circuit connected to a load circuit,

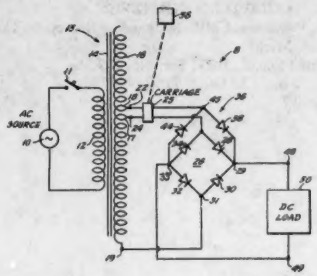
the improvement wherein said timing means comprises logical circuitry responsive to said clock pulses and said control voltage for transmitting said firing pulses to said second ancillary thyristor from the beginning of each recurrence period to an intermediate instant determined by said control voltage and transmitting said firing pulses to said first ancillary thyristor from said intermediate instant to the end of each recurrence period, with transmission of said firing pulses to said first main thyristor starting after the beginning of each recurrence period and terminating at said intermediate instant whereas transmission of said firing pulses to said second main thyristor starts after said intermediate instant and terminates at the end of each recurrence period whereby said ancillary thyristors are alternately turned on in continuous succession to keep said commutating capacitor at all times operatively connected to a terminal of said power supply.

4,330,818

VARIABLE VOLTAGE DIRECT CURRENT POWER SUPPLY AND MOTOR SPEED CONTROL

Stanley G. Peschel, Minor Rd., Brewster, N.Y. 10509

Filed Feb. 19, 1980, Ser. No. 122,189
Int. Cl.³ H02M 7/06
U.S. Cl. 363—126 5 Claims



1. An adjustable-voltage direct current (DC) power supply having a variable transformer with a core of magnetically permeable material which is encircled by at least one electrical winding with segments of said winding being exposed for electrical contact therewith and having first and second highly conductive electrical brushes with means for simultaneously traversing said first and second brushes along first and second traverse paths, respectively, along said winding with at least one of said brushes always contacting an exposed segment of said winding for delivering alternating current (AC) from said brushes, said DC power supply comprising:

first and second output terminals adapted to be connected to a DC electrical load,

first unidirectional conduction means connected in the forward direction from the first brush to the first output terminal,

second unidirectional conduction means connected in the forward direction from the second output terminal to said first brush,

third unidirectional conduction means connected in the forward direction from the second brush to the first output terminal,

fourth unidirectional conduction means connected in the forward direction from the second output terminal to said second brush,

fifth unidirectional conduction means connected in the forward direction from a terminal of said electrical winding to the first output terminal,

sixth unidirectional conduction means connected from the second output terminal to said terminal of said electrical winding,

AC current being prevented from flowing from one brush to another through said first and third unidirectional conduction means in series by their mutually blocking relationship,

AC current being prevented from flowing from one brush to another through said second and fourth unidirectional conduction means in series by their mutually blocking relationship,

whereby DC electrical power full-wave rectified is delivered to the load and the voltage of said DC electrical power can be continuously varied by simultaneously traversing said first and second brushes along said first and second traverse paths, respectively, and

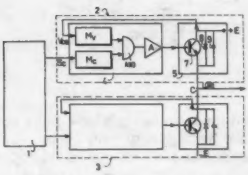
whereby said DC electrical power is delivered by whichever of said brushes happens to be in contact with an exposed segment of the winding at the higher AC voltage.

4,330,819

STATIC SEMI CONDUCTOR ELECTRICAL ENERGY CONVERTER

Henri Foch, and Jacques Roux, both of Toulouse, France, assignors to Agence Nationale de Valorisation de la Recherche, Neuilly sur Seine, France

Filed Nov. 13, 1979, Ser. No. 93,106
Claims priority, application France, Nov. 13, 1978, 78 32428
Int. Cl.³ H02M 7/537
U.S. Cl. 363—132 9 Claims



1. Static semiconductor electrical energy converter, comprising:

a power stage comprising at least one power transistor having a collector, base and emitter, and a commutation assistance circuit for steering its collector current in the course of blocking commutations of the said transistor;

a control stage adapted to generate for each power transistor, a control signal S_C in the form of a pulse train having a repetition frequency proportional to the desired output voltage;

each power transistor being a transistor having a voltage V_{CEX} (collector-emitter voltage at a null collector current and base negatively biased) greater than its voltage V_{CEO} collector emitter voltage (base open);

a signal processing stage associated with each power transistor and having two inputs, the signal S_C being applied to one input and the collector/emitter voltage V_{CE} of the power transistor being applied at all time to the other input, the output of the signal processing stage being connected to said power stage to trigger the commutations of the power transistor, the signal processing stage being adapted to drive the base of the said power transistor in a fashion so as to render the transistor conductive in the single case where, simultaneously, the control signal S_C has a value corresponding to an initiation of conduction of the transistor and the voltage V_{CE} of the said transistor is adjacent to zero;

and to assure reverse biasing of the base of said each power transistor in all other cases in order to exploit the voltage V_{CEX}.

4,330,820

CIRCUIT FOR FORMING PERIODIC PULSE PATTERNS

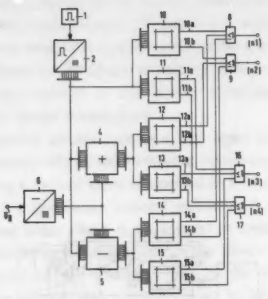
Rüdiger Braun, Erlangen, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Jun. 4, 1979, Ser. No. 44,931

Claims priority, application Fed. Rep. of Germany, Jul. 18, 1978, 2831589

Int. Cl.³ H03K 3/64, 3/78

U.S. Cl. 363—135 3 Claims



1. A circuit for forming a periodic pulse pattern comprising:

an oscillator having an output;

a binary-coded counter having an input coupled to the output of the oscillator, the counter having an address signal as an output;

a first memory containing a first auxiliary pulse pattern, the memory having the address signal as an input and having an auxiliary periodic pulse pattern as an output;

address shifting means comprising at least one of an adder or a subtractor having a first input coupled to the output of the counter and a second input coupled to a number determined by a control signal, the address shifting means having an output signal;

a second memory containing a second auxiliary pulse pattern, the second memory having an address input coupled to the output of the address shifting means and having a second auxiliary pulse pattern as an output; and

logic means having the outputs of the memories as inputs and having the periodic pulse pattern as outputs.

4,330,821

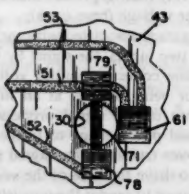
RADIATION SWITCH FOR PHOTOFLASH UNIT

Boyd G. Brower, and John W. Shaffer, both of Williamsport, Pa., assignors to GTE Products Corporation, Stamford, Conn.

Filed May 9, 1980, Ser. No. 148,358

Int. Cl.³ G03B 15/02

U.S. Cl. 362—4 13 Claims



6. In a multilamp photoflash unit comprising a pair of flashlamps, an electrical circuit into which said lamps are arranged to fire individually and in sequence, and a solid state radiation switch located external of the lamps and forming part of said electrical circuit, said switch being located adjacent one of said flashlamps to receive radiant energy emitted by that flashlamp, the improvement wherein said radiation switch comprises an admixture of material including silver carbonate and/or silver oxide, a binder, and a selected proportion of silver-coated glass beads.

4,330,822

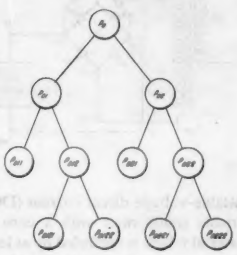
RECURSIVE SYSTEM AND METHOD FOR BINDING COMPILED ROUTINES

Bill R. Dodson, Pasadena, Calif., assignor to Burroughs Corporation, Detroit, Mich.

Filed Sep. 2, 1971, Ser. No. 177,304

Int. Cl.³ G06F 7/00, 9/00

U.S. Cl. 364—200 18 Claims



1. An information processing system for completing the object code for a host program routine by fetching and binding, to said object code, different levels of precompiled subroutines, said system comprising:

storage means to receive a series of program lists for said host program and different levels of subroutines required to be bound to said host program routine; and

processor means coupled to said storage means to search said host program list for references to precompiled subroutines, said processor means being adapted to re-enter its search routine, when such a reference is found, to search a program list of the referred-to subroutine for references to a next level of precompiled subroutines required to be bound to said referred-to subroutine;

said processor means being further adapted to execute the host program object code thus completed.

4,330,823

HIGH SPEED COMPACT DIGITAL COMPUTER SYSTEM WITH SEGMENTALLY STORED MICROINSTRUCTIONS

Charles T. Retter, Framingham, Mass., assignor to Data General Corporation, Westboro, Mass.

Filed Dec. 6, 1978, Ser. No. 967,041

Int. Cl.³ G06F 9/22

U.S. Cl. 364—200 5 Claims

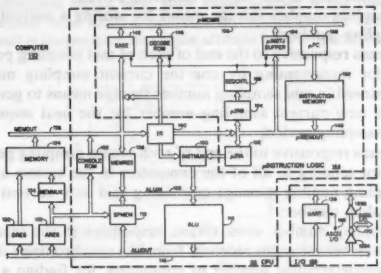
1. A digital computer system including processor means for processing digital data; microinstruction logic means for providing sequences of microinstructions for controlling said processor means; memory means for storing at least macroinstructions employed in controlling said system; and memory output bus means for conducting said at least macroinstructions from said memory means to said microinstruction logic means; said microinstruction logic means comprising:

means for receiving and storing first certain ones of said macroinstructions for selecting operations to be performed by said processor means, each one of said first certain ones of said macroinstructions corresponding to an associated one of said sequences of microinstructions for controlling said processor means;

microinstruction memory means for segmentally storing each microinstruction of each one of said sequence of

microinstructions, wherein each said microinstruction is divided into a plurality of segments and each one of said segments is stored in a separate location in said microinstruction memory means,

decoding means responsive to each one of said first certain ones of said macroinstructions for sequentially selecting each one of said segments of said each one of said microinstructions of said corresponding sequences of microinstructions; and



means connected from said microinstruction memory means and responsive to operation of said decoding and selecting means for (1) sequentially receiving and storing said each one of said segments of said corresponding each one of said microinstructions, and (2) providing said corresponding sequences of microinstructions for controlling said processor means.

4,330,824

UNIVERSAL ARRANGEMENT FOR THE EXCHANGE OF DATA BETWEEN THE MEMORIES AND THE PROCESSING DEVICES OF A COMPUTER

Paul M. Girard, Versailles, France, assignor to Compagnie Internationale pour l'Informatique Cii Honeywell Bull (Societe Anonyme), Paris, France

Filed Aug. 8, 1979, Ser. No. 64,791

Claims priority, application France, Aug. 17, 1978, 78 23954

Int. Cl.³ G06F *3/06*

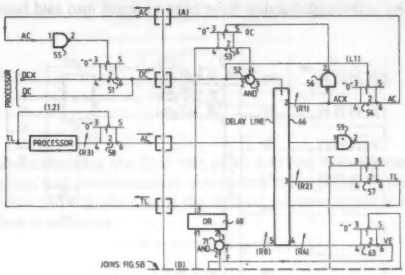
U.S. Cl. 364—200 **6 Claims**

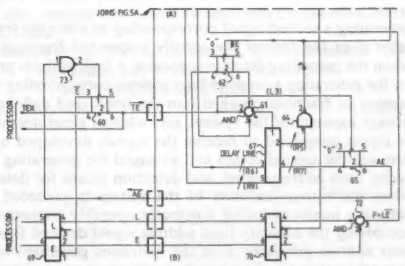
1. An interface for controlling the exchange of data between a memory unit and at least one processing unit of a computer wherein the operations performed by the processing unit on the memory unit are performed over a time varying period and include the initiation of a memory cycle determined by a memory cycle request signal (DC) and a cycle acknowledge signal (AC), the execution of a write operation determined by a write initiate signal (TE) and a write finish signal (AE) and the execution of a read operation determined by a data ready signal (TL) and a reading finished signal (AL) comprising:

a delay device (**66, 67**) having a plurality of delay outputs and having an input connected to receive the memory cycle request signal (DC) emitted by the processing unit and being operable to transmit said signal (DC) after a first delay (Ri) to the processing unit, said delayed cycle request signal establishing the cycle acknowledge signal (AC) for indicating that a memory cycle has been initiated.

a first storage means (**70**) in the memory unit, a second storage means (**69**) in the processing unit, said second storage means adapted to store information indicating that either the write or the read operation, or both, are to be performed, means connecting the output of the second storage means to the input of the first storage means to transfer the information to the first storage means, said transfer being effected during an interval of time defined by the cycle request signal (DC) and the cycle acknowledge signal (AC).

first means for linking the memory cycle request initiated by the processing unit with a read operation in the memory unit requested by said processing unit in response to the data ready signal TL and the reading finished signal (AL), said data ready signal being obtained from an output of said delay device (**66,67**) after an adjustable delay (**R2**) determined by said delay device (**66,67**) and transmitted to said processing unit for execution of the read operation, the reading finished signal (AL) being outputted by the processing unit after receipt of the data ready signal (TL) and an adjustable delay (**R3**) determined by the processing unit, and





second means for linking the memory cycle request initiated by the processing unit with a write operation in the memory unit requested by said processing unit in response to the write initiate signal (TE) and the write finish signal (AE), said write initiate signal being initiated by the processing unit and transmitted to the memory unit after an adjustable delay (**R4**) by said delay device (**66,67**), said write finish signal (AE) being obtained from an output of delay device (**66,67**) after an adjustable delay (**R7**) determined by said delay device whereby the exchange of data may be controlled between processing units and memory units having different timing for the signals exchanged.

4,330,825

DEVICE FOR AUTOMATIC CONTROL OF THE STORAGE CAPACITY PUT TO WORK IN DATA PROCESSING SYSTEMS

Paul Girard, Versailles, France, assignor to Compagnie Internationale Pour l'Informatique Cii Honeywell Bull (Societe Anonyme), Paris, France

Filed Dec. 6, 1979, Ser. No. 100,855

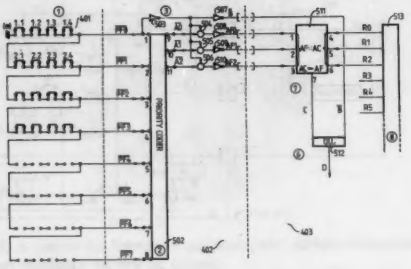
Claims priority, application France, Dec. 6, 1978, 78 34413

Int. Cl.³ G11C *5/02, 29/00*; G06F *13/00*

U.S. Cl. 364—200 **15 Claims**

1. In a circuit arrangement for automatically determining the storage capacity of a data processing or transmission system having a store and data processing circuits adapted to generate addresses for access to data contained in the store, said store

being divided up into a plurality of serially connected storage fractions, including a first fraction and at least one additional fraction, each storage fraction comprising a plurality of electronic storage modules, means for plugging each electronic module into a printed circuit board having printed conductors thereon arranged in cascade and space from each other at selected locations in order to effect connections between the storage modules of the store and data processing circuits, first means on said printed circuit board for detecting when all of the storage modules corresponding to the first fraction have been plugged into said board and developing a first signal in response thereto, second means on said printed circuit board for detecting when all of the storage modules of said at least one additional fraction have been plugged into said board for



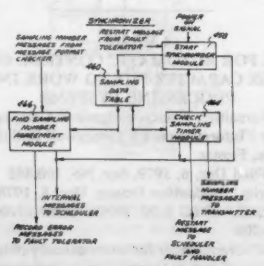
generating a second signal corresponding to a storage fraction other than the first of the serially connected fractions only when the preceding fraction is present, a limit address generator for generating a capacity limit address corresponding to the number of fractions plugged into the board and defining the storage capacity of the system, said address generator having its inputs connected to receive the signals developed by the first and the second means and arranged for generating a capacity limit address signal, and detection means for detecting when the storage capacity of the system is exceeded, said detection means including a detector operably connected for comparing the capacity limit address signal derived from the limit address generator with the addresses generated by the data processing circuits when the latter generate an address for access to the data contained in the said storage modules.

4,330,826

SYNCHRONIZER AND SYNCHRONIZATION SYSTEM FOR A MULTIPLE COMPUTER SYSTEM

Arliss E. Whiteside, Royal Oak, and Morris D. Freedman, Southfield, both of Mich., assignors to The Bendix Corporation, Southfield, Mich.

Filed Feb. 5, 1980, Ser. No. 118,691
Int. Cl.³ G06F *11/16, 15/16*
U.S. Cl. 364—200 **38 Claims**



1. A synchronization system for a multiple computer system having a plurality of computers and a communication network interconnecting said plurality of computers whereby each computer in the system can send messages to and receive messages from every other computer in the system, and wherein a predetermined number of said plurality of computers has a synchronizer, said synchronizer comprising:

sampling period timer means for repetitively generating sequential sampling periods, said sampling period timer storing a remaining time number indicative of the time remaining in the current sampling period;

sampling number storage means for storing a current sampling number;

means responsive to the end of each of said sampling periods for incrementing by one the current sampling number stored in said sampling number storage means to generate a new current sampling number for the next sequential sampling period;

means responsive to the end of each of said sampling periods for sending to all of the computers in the system a sampling number message containing said new current sampling number;

sampling number voter means, responsive to the sampling number messages received from like synchronizers in said predetermined number of computers, for finding a sampling number which agrees with the sampling number contained in a predetermined number of sampling number messages received from the other synchronizers to generate a voted sampling number having the same value as said found sampling number which agreed with said predetermined number of sampling number, said sampling number voter means including means for recording said voted sampling number in said sampling number storage means as said current sampling number;

means responsive to generating said voted sampling number for determining if the current sampling period being generated by said sampling period timer means is synchronized, within predetermined limits, to end with the ends of the sampling periods being generated by said like sampling period timer means in said predetermined number of computers; and

means responsive to the determination that said current sampling period will not end within said predetermined limits for readjusting the length of said current sampling period to cause said current sampling period to end with the ends of the sampling periods generated by said like sampling period timer means within said predetermined limits to synchronize said sampling period timer means with said like sampling period timer means.

4,330,827

AIRCRAFT AUTOPILOT SYSTEM

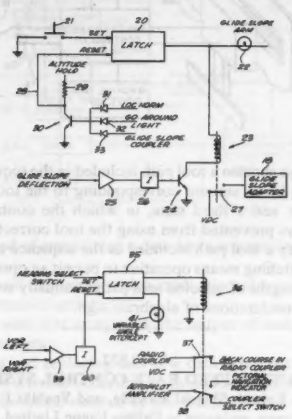
Douglas L. Kettler, 1212 N. Broadway, Apt. H, Escondido, Calif. 92026

Filed Mar. 31, 1980, Ser. No. 135,327
Int. Cl.³ G05D *1/12*; B64C *13/18*
U.S. Cl. 364—428 **6 Claims**

1. In an aircraft autopilot system having a pictorial navigation indicator selectively adjustable to different headings and providing an electric signal representative thereof; an artificial horizon indicator providing a signal corresponding to unbalanced altitude of the aircraft; a radio coupler selectively adjustable to provide a controlling signal to follow a course defined by an omni, ILS beams (LOC NORM), preset heading of a pictorial navigation indicator or to seek out a predetermined omni (NAV); an amplifier having inputs for receiving the recited electric signals and outputs interconnected with a pitch servosystem and a roll servosystem for adjusting the controls of the aircraft; and altitude hold means selectively adjustable to provide signals corresponding to different altitudes which are fed into the amplifier for automatically positioning the aircraft to the selected altitude; and a glide slope coupler including a glide slope adapter interconnected with the artificial horizon

indicator and altitude hold for cooperative action with the radio coupler to track the aircraft along ILS beams for landing; and a console including first switches for selectively connecting and disconnecting the amplifier with individually adjustable roll and pitch signal means, and second switches for selectively connecting and disconnecting the altitude hold and heading from the pictorial navigation indicator and radio coupler, the improvement comprising:

first means selectively actuatable to connect the glide slope adapter to electrical power during the existence of a glide deflection signal, said glide slope adapter being disconnected from electric power when either (a) the altitude hold is inoperative, or (b) the altitude hold is operative and



at least one of the following exists: the radio switch LOC NORM is off, or glide slope coupling has been achieved;

second means for maintaining the autopilot under control of the preset heading on the pictorial navigation indicator when the radio coupler is preset to NAV including third means for placing the automatic pilot under control of the radio coupler and interrupting heading control by the pictorial navigation indicator upon actual intercept of a selected omni occurring; and

selectively actuatable fourth means for disconnecting the console pitch signal from the amplifier and interconnecting a pitch signal of predetermined fixed magnitude to said amplifier, and further means simultaneously actuated for energizing a GO-AROUND light.

4,330,828

METHOD OF CONTROLLING PRODUCTION PROCESSES AND APPARATUS THEREFOR

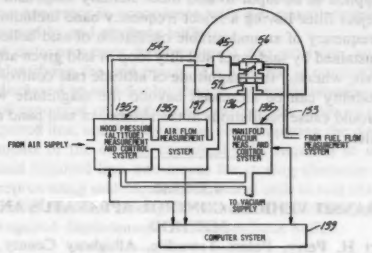
Richard L. Smith, Livonia, and Kent V. Allen, New Baltimore, both of Mich., assignors to Scans Associates, Inc., Livonia, Mich.

Continuation-in-part of Ser. No. 926,913, Jul. 21, 1978, Pat. No. 4,250,543. This application Oct. 11, 1979, Ser. No. 83,832

Int. Cl.³ G05B *11/36, 13/02;* G01M *19/00*

U.S. Cl. 364—431 **104 Claims**

71. A method of testing carburetors at any desired number of points in the carburetors operating range using subsonic flow to determine the air flow and fuel flow rate through the test carburetor, said method including the steps providing a suitable testing stand on which to mount the carburetor, providing a suitable hood above said testing stand adapted to sealingly enclose said carburetor, continuously controlling the pressure within said hood utilizing a hood pressure measurement and control system including a three-state fourmode process controller utilizing desired value, feedback, and reset state signals to cause said process controller to operate in said three states depending on the value of said signals so as to quickly produce the desired hood pressure at each point at which said carburetor test will take place in the best possible time, simultaneously controlling the pressure of the fuel entering the carburetor, simultaneously inducing air flow through said carburetor by providing a vacuum downstream of said carburetor, simulta-


FROM AIR SUPPLY
HOOD PRESSURE (ALTITUDE) MEASUREMENT AND CONTROL SYSTEM
AIR FLOW MEASUREMENT SYSTEM
MANIFOLD VACUUM MEAS. AND CONTROL SYSTEM
FROM FUEL FLOW MEASUREMENT SYSTEM
TO VACUUM SUPPLY
COMPUTER SYSTEM

neously determining the flow rate of air and fuel entering the carburetor, and simultaneously controlling the rotation of the carburetor throttle plate until the desired predetermined test condition is achieved.

4,330,829

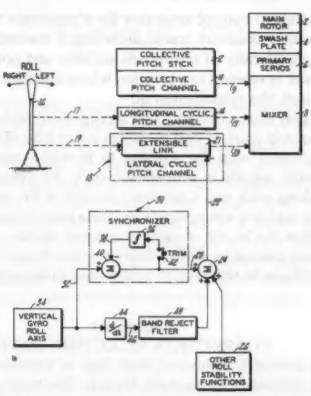
HELICOPTER FLIGHT STABILITY CONTROL INDUCED OSCILLATION SUPPRESSION

William C. Fischer, Monroe, and Don L. Adams, Fairfield, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Continuation of Ser. No. 6,313, Jan. 24, 1979, abandoned. This application Jul. 7, 1980, Ser. No. 166,010

Int. Cl.³ G06G *7/70;* B64C *11/34*

U.S. Cl. 364—434 **4 Claims**



1. A control for a helicopter having an outer loop control system coupled with the pilot control members for controlling a given attitude axis of the helicopter and an automatic flight control system inner stability loop related to said given attitude axis, comprising:

means providing a desired attitude signal indicative of a desired helicopter attitude in said given attitude axis;

means for sensing the attitude of the helicopter in said given attitude axis and for providing an actual attitude signal indicative thereof;

means responsive to said desired attitude signal and to said actual attitude signal to provide an attitude hold signal input to said inner stability loop as a function of the difference between said desired attitude signal and said actual attitude signal;

means for sensing the rate of change of attitude of the helicopter in said given attitude axis to provide an attitude rate of change signal; and

a band reject filter connected to receive said attitude rate of change signal, the output of said band reject filter being applied as an input to said inner stability loop, said band reject filter having a reject frequency band including the frequency of an undesirable oscillation of said helicopter sustained by said inner stability loop in said given attitude axis, whereby the magnitude of attitude rate control over stability can be increased beyond the magnitude which would cause oscillations in the absence of said band reject filter.

4,330,830

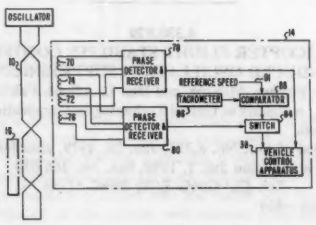
TRANSIT VEHICLE CONTROL APPARATUS AND METHOD

Robert H. Perry, Peters Township, Allegheny County, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Nov. 27, 1979, Ser. No. 97,766

Int. Cl.³ G06G *7/70*; B61L *3/00*

U.S. Cl. 364—436 **12 Claims**



1. In speed control apparatus for a passenger vehicle operative with a roadway track, including a transmitting antenna having a pluralty of transposed sections and positioned along the track in relation to a location where a predetermined speed is desired, the combination of:

a signal means having a coil arrangement including first and second pairs of coil members carried by said vehicle and coupled with the antenna to provide respective output pulse signals in accordance with the vehicle movement along each said transposed section of the antenna,

with said coil arrangement having a total physical length less than the length of each transposed section, and

means carried by said vehicle for controlling the speed of the vehicle in response to said output pulse signals.

4,330,831

CORRECTION SELECTION DEVICE

Ernst Schwefel, Traunreut, Fed. Rep. of Germany, assignor to Dr. Johannes Heidenhain GmbH, Traunreut, Fed. Rep. of Germany

Filed Oct. 19, 1979, Ser. No. 86,327

Claims priority, application Fed. Rep. of Germany, Oct. 24, 1978, 2846170

Int. Cl.³ G06F *15/46*; G05B *19/25*

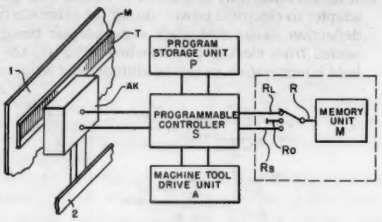
U.S. Cl. 364—474 **6 Claims**

1. In a control system for positioning a tool with respect to a workpiece, said system including control means for automatically and sequentially moving the tool along a sequence of tool paths with respect to the workpiece, the improvement comprising:

means, coupled to the control means, for storing a tool correction value;

switching means, coupled to the control means and adapted to be manually operated while the control means sequentially moves the tool, for designating an effective tool correction to be used by the control means to modify the lengths of selected ones of the sequence of tool paths;

said switching means being manually switchable between a first state, in which the control means is always caused to lengthen a tool path included in the sequence of tool paths by an amount corresponding to the tool correction value; a second state, in which the control means is caused to



always shorten a tool path included in the sequence of tool paths by an amount corresponding to the tool correction value; and a third state, in which the control means is always prevented from using the tool correction value to modify a tool path included in the sequence of tool paths;

said switching means operative to permit an operator to alter the lengths of selected tool paths manually without resort to considerations of algebraic sign.

4,330,832

CUTTER FEED RATE CONTROL SYSTEM

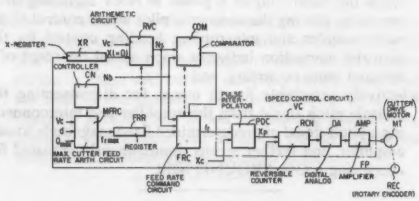
Yoshinori Kohzai; Shigeki Kawada, and Yoshiki Fujioka, all of Hino, Japan, assignors to Fujitsu Fanuc Limited, Hino, Japan

Filed Mar. 7, 1980, Ser. No. 128,173

Claims priority, application Japan, Mar. 13, 1979, 54-29086

Int. Cl.³ G05B *19/18*

U.S. Cl. 364—474 **6 Claims**



1. In a method of controlling the feed rate of a cutter employed in a machine tool of the type in which a spindle is rotated by an electric motor having operating regions of constant torque and output characteristics so as to render constant the circumferential speed of a workpiece while the workpiece is subjected concurrently to a machining operation by moving a cutter into contact therewith, the improvement comprising the steps of:

storing a maximum cutter feed rate f_{rmax} which is computed from a circumferential speed V_c of the workpiece, a cutting width d of the cutter, and a maximum cutting quantity Q_{max} decided by the maximum power P_{max} of the motor;

computing a spindle speed N_s from an equation $N_s = V_c/\pi \cdot D$ where D is the outer diameter of the workpiece;

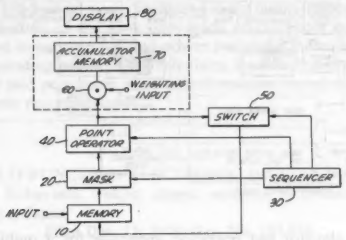
comparing the magnitude of the spindle speed N_s with the magnitude of a base speed N_b defined as a spindle speed at which there is a transition from the constant torque region of the motor to the constant output region thereof; and

feeding the cutter at the feed rate f_{rmax} when $N_s \geqq N_b$ and at a feed rate which is reduced in conformance with the spindle speed N_s when $N_s < N_b$.

4,330,833
METHOD AND APPARATUS FOR IMPROVED DIGITAL IMAGE PROCESSING

William K. Pratt, Santa Monica, Calif.; Jean-Francois Abramatic, Versailles, and Olivier Faugeras, Saint Nom La Breteche, both of France, assignors to Vicom Systems, Inc., San Jose, Calif.

Filed May 26, 1978, Ser. No. 910,089
Int. Cl.[3] G06F *15/31;* H04N *5/21*
U.S. Cl. 364—515 13 Claims



1. A method of convolving a data array comprising the steps of

scanning said data array with a mask selected according to a predetermined criteria,

replacing said data array with the output of said scan as a new data array,

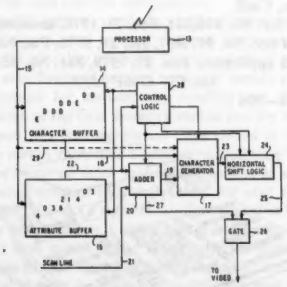
rescanning and replacing said new data array with a different mask selected according to said predetermined criteria a predetermined number of times, and

extracting the new data array as an output data array after completion of the predetermined number of scans.

4,330,834
GRAPHICS DISPLAY APPARATUS

Alan S. Murphy, Eastleigh, England, assignor to International Business Machines Corp., Armonk, N.Y.

Filed Apr. 24, 1980, Ser. No. 143,247
Claims priority, application United Kingdom, May 2, 1979, 7915281
Int. Cl.[3] G06F *3/153*
U.S. Cl. 364—521 9 Claims



1. A cell-organized graphic display apparatus comprising a point-addressable display device, a character buffer adapted to contain character codes of image cells to be displayed, a character generator adapted to contain bit patterns representing image cells including a set of canonical cells, means for reading character codes from said character buffer to access related bit patterns within said character generator, means for applying said accessed bit patterns to said display device, and a data processor adapted to load said character buffer with character codes representing image cells required to be displayed on said display device, wherein the improvement comprises,

an attribute buffer having means to store attribute bits associated with the character codes stored in said character buffer,

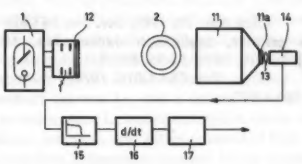
means for shifting the bit patterns obtained from said character generator in accordance with associated attribute bits stored in said attribute buffer,

said data processor having means for receiving an input identifying the end points of a line that is required to be displayed on said display device, means for selecting a pair of canonical cells whose slopes span the slope of the required line, and having means for computing the displacements of the chosen canonical cells required to display said required line, and means for storing character codes representing said required canonical cells in said character buffer and for storing attribute bits indicative of their required displacements in said attribute buffer.

4,330,835
METHOD AND APPARATUS FOR DETERMINING THE INTERNAL DIMENSION OF HOLLOW BODIES

Ulrich Gehm, Norderstedt, Fed. Rep. of Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Sep. 19, 1979, Ser. No. 76,888
Claims priority, application Fed. Rep. of Germany, Sep. 20, 1978, 2840819
Int. Cl.[3] G01N *23/00*
U.S. Cl. 364—560 15 Claims



1. A method of determining dimensions of elongated hollow bodies by X-rays or gamma rays comprising the steps of irradiating a hollow body with a radiation source being outside of said hollow body, and measuring an intensity variation at an opposite side of said hollow body from said radiation source by carrying out measurements along a line transverse to an axis through said hollow body and extending in a plane through said radiation source transverse of said axis, wherein minimum intensity values representative of edge locations of said hollow body are provided in said plane, the distance between said minimum intensity values representing said dimensions of said hollow body.

4,330,836
ELEVATOR CAB LOAD MEASURING SYSTEM

Andrew J. Donofrio, Newington, and John E. Gaines, Granby, both of Conn., assignors to Otis Elevator Company, Hartford, Conn.

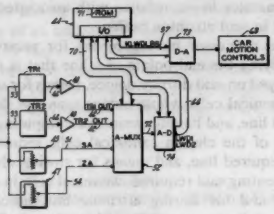
Filed Nov. 28, 1979, Ser. No. 98,004
Int. Cl.[3] B66B *1/44;* G01G *19/413*
U.S. Cl. 364—567 22 Claims

18. A load weighing system for use in an elevator system wherein the cab is supported on a frame, said system comprising:

apparatus which is located between the cab and the frame, said apparatus transmitting supporting force to the cab through at least one selected point on the cab and generating a signal associated with each selected point, the magnitude of the signal reflecting the force transmitted to its corresponding point, each point or points being selected so that the sum of the forces at the selected point or points

is substantially the same for a given weight regardless of the distribution of the weight in the car, and

means responsive to the transducer signals and a signal reflecting the empty cab weight for providing a cab load



signal reflecting the sum of all the signals from the transducers and for providing a passenger/duty load signal reflecting the difference between that cab load signal and the signal reflecting the empty cab weight.

4,330,837

ELECTRONIC WEIGHING APPARATUS

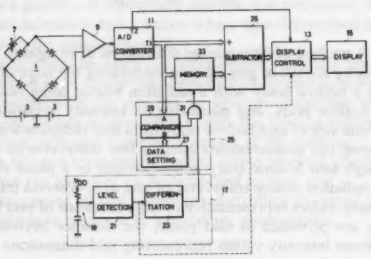
Seiichi Itani, Sakai, Japan, assignor to Kubota Ltd., Osaka, Japan

Filed Apr. 21, 1980, Ser. No. 142,416

Claims priority, application Japan, Jun. 19, 1979, 54-84608[U]; Jul. 10, 1979, 54-95285[U]

Int. Cl.³ G01G *19/413*

U.S. Cl. 364—567 **18 Claims**



1. An electronic weighing apparatus, comprising: power supply means, weight value data providing means for providing data representing the weight of an article being weighed, storage means for storing said weight value data obtained from said weight value data providing means, correcting means responsive to said stored data in said storage means for correcting said weight value data, display means for displaying said weight value data as corrected by said correcting means, storage enabling means for enabling the storage of said weight value data in said storage means, said storage enabling means comprising timing means responsive to said power supply means for providing a signal for said storage enabling after the lapse of a predetermined time period following turning on of said power supply means, determining means for determining whether said weight value data are within a predetermined range, disabling means responsive to a decision by said determining means that said weight value data is not within said predetermined range for thereby disabling said storage enabling means.

4,330,838

ELEVATOR TEST OPERATION APPARATUS

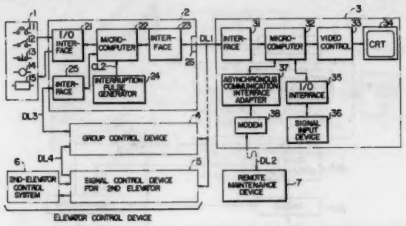
Kenji Yoneda; Masao Nakazato; Takeo Yuminaka; Kazuhiro Sakata, all of Katsuta, and Soshiro Kuzunuki, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jul. 9, 1979, Ser. No. 56,149

Claims priority, application Japan, Jul. 7, 1978, 53-82042

Int. Cl.³ B66B *3/00*; G06F *15/20*

U.S. Cl. 364—580 **16 Claims**



1. An elevator test operation apparatus for a multi-floor service elevator, comprising:

a digital computer for processing a signal from an elevator control system in accordance with an elevator operation control program to operate said elevator;

first interface means for transferring the signal from said elevator control system to said digital computer; and

second interface means for transferring a signal from said digital computer to said elevator control system, wherein the improvement comprises test operation control means built into said digital computer for executing the test operation of said elevator, and means connected to said digital computer through detachable connector means for generating a test operation signal for actuating said test operation control means.

4,330,839

PROGRAMMABLE CALCULATOR INCLUDING MEANS FOR AUTOMATICALLY PROCESSING IMFORMATION STORED ON A MAGNETIC RECORD MEMBER

Bradley W. Miller; Franklin T. Hickenlooper; David C. Uhlrich; Marl D. Godfrey; Douglas M. Clifford; Rex L. James; Robert E. Watson; John C. Keith, and Allen C. Mortensen, all of Loveland, Colo., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Division of Ser. No. 880,241, Feb. 22, 1978, abandoned, which is a division of Ser. No. 597,957, Jul. 21, 1975, Pat. No. 4,089,059. This application Jun. 29, 1979, Ser. No. 53,442

Int. Cl.³ G06F *13/00*

U.S. Cl. 364—706 **3 Claims**

1. An electronic calculator comprising:

keyboard input means for entering information into the calculator;

memory means, coupled to said keyboard input means, for storing information entered into the calculator from said keyboard input means;

processing means, coupled to said keyboard input means and memory means, for processing information stored in said memory means;

magnetic reading and recording means, coupled to said processing means, and including a magnetic record member, for tranferring information between said memory means and said magnetic record member;

mode selection means for enabling the operator to select an auto start mode of calculator operation; and

power switching means for enabling the operator to apply operating power to the calculator;

said processing means including logic means responsive to selection of the auto start mode of calculator operation and to actuation of said power switching means applying operating power to the calculator for initiating processing by said processing means of information stored on a magnetic record member.

4,330,840

MULTI-FUNCTION ELECTRONIC DIGITAL WATCH

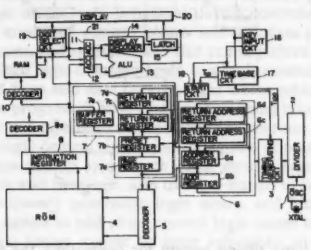
Isamu Kobayashi, Tokyo, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 21, 1979, Ser. No. 105,926

Claims priority, application Japan, Jan. 17, 1979, 54-2972

Int. Cl.[3] G06F *7/48, 15/02;* G04B *19/30*

U.S. Cl. 364—705 5 Claims



1. A digital watch of the dynamic logic type comprising:

first memory means in which a series of control instructions are written;

arithmetic means coupled to an output of said first memory means to receive control instructions from said first memory and to execute predetermined operations in accordance with said control instructions;

second memory means coupled to said arithmetic means and a timing means, said second memory means storing time signals of a plurality of digits therein; control means coupled to said first and second memory means and to said timing means for sequentially reading out the control instructions of the first memory means and for renewing a time signal of a less significant digit stored in the second memory means each time a predetermined time base signal has been received from said timing means in accordance with a read control instruction and for also renewing a time signal of a more significant digit stored in the second memory means when a carry signal has generated in the renewed time signal of the less significant digit;

count means in said timing means coupled to receive a timing signal shorter in period than the time base signal;

indication input means;

temporary holding means coupled to said count means, said indication input means, and said second memory means to load an output of said count means upon an indication of said input means and to pass this loaded output to said second memory means for storage; and

output means coupled to the second memory means and said arithmetic means to deliver an output signal including a time signal of a least significant digit determined by the period of said timing signal shorter in period then the time base signal, on the basis of an output of said holding means and the time signals stored in said second memory means.

4,330,841

LOGIC CIRCUIT WITH ASYMMETRICAL QUANTUM INTERFEROMETRIC CIRCUITS

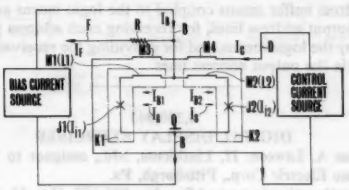
Hazime Yamada, Hoya, and Akira Ishida, Tokyo, both of Japan, assignors to Nippon Telegraph & Telephone Public Corp., Tokyo, Japan

Filed Apr. 16, 1980, Ser. No. 140,756

Claims priority, application Japan, Jul. 25, 1979, 54-94450; Jul. 25, 1979, 54-94451

Int. Cl.[3] G06F *7/50*

U.S. Cl. 364—784 6 Claims



1. A logic circuit having at least one asymmetrical quantum interferometric circuit, wherein the logic output states correspond to the voltage states of the asymmetrical quantum interferometric circuit, said asymmetrical quantum interferometric circuit comprising: a parallel circuit including a first Josephson junction having a threshold current I_{J1}, and a first inductance element having an inductance L_1 and connected in series with said first Josephson junction, a second Josephson junction having a threshold current I_{J2}, and a second inductance element having an inductance L_2 and connected in series with said second Josephson junction, said series-connected first Josephson junction and first inductance element being connected in parallel with said series-connected second Josephson junction and second inductance element to form a parallel circuit; a bias feeder connected to said parallel circuit for supplying a bias current to said parallel circuit; a control current feeder having series-connected inductance elements electromagnetically coupled respectively with said first and second inductance elements for supplying a control current to same; and an output feeder operatively connected to said bias current feeder and said parallel circuit, the arrangement being such that the following relations are satisfied: $I_{J2}/I_{J1}=L_1/L_2=a$, and $L_1 I_{J1}=L_2 I_{J2}<\Phi_o$ where a is a real number greater than 1, and Φ_o is a flux quantum unit equal to 2×10^{-15} Wb.

4,330,842

VALID MEMORY ADDRESS PIN ELIMINATION

R. Gary Daniels, 9005 Charnwood, Round Rock, Tex. 78664; Thomas H. Bennett, 4344 E. Desert Crest Dr., Scottsdale, Ariz. 85258, and Michael F. Wiles, 1902 Flintrock St., Round Rock, Tex. 78664

Filed Sep. 5, 1978, Ser. No. 939,723

Int. Cl.[3] G06F *3/00, 13/00*

U.S. Cl. 364—900 5 Claims

1. A monolithic integrated circuit comprising:

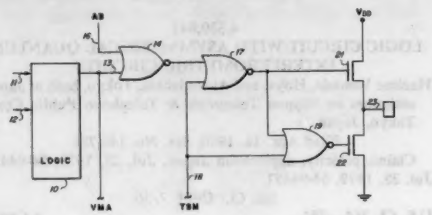
a plurality of output address lines;

an internal address bus;

generating means for generating a valid memory address signal in response to an address on the internal address bus being a valid memory address;

logic means coupled to the internal address bus and to the generating means, for receiving addresses via the internal address bus, for receiving the valid memory address signal, and for providing the address received via the internal

address bus only if the valid memory address signal is simultaneously received; and



address buffer means coupled to the logic means and to the output address lines, for receiving each address provided by the logic means, and for providing the received address via the output address lines.

4,330,843

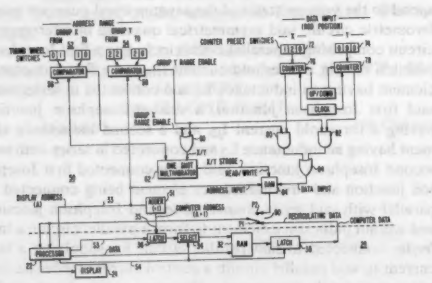
DIGITAL DISPLAY EXERCISER

Charles A. Lawson, II, Linthicum, Md., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 950,358, Oct. 11, 1978, abandoned. This application Dec. 4, 1979, Ser. No. 100,171

Int. Cl.³ G06F *3/14*

U.S. Cl. 364—900 **2 Claims**



1. In combination, a data acquisition and storage system wherein data from at least one data source is processed for display and is stored both for recirculation as displayed data and for access by an external central computer means wherein the data acquisition and storage system includes a data processor means having an input and an output including means for generating display addresses at said output for addressing the respective data sources and causing data from the data sources to be supplied to the input of said data processor means, a display means operatively coupled to the output of said data processor means to provide a visual display of the data from said data sources and the data recirculated from storage, and a storage means for retaining the data processed from the respective data sources in storage locations corresponding to the display addresses associated with the respective data sources, and computer interface circuit means responsive to an address data generated by an external central computer means to access and read out data stored in said storage means at an address location corresponding to said address data, the combination of:

a display exerciser means, and switching means for connecting said display exerciser means in parallel with said data acquisition and storage system while disconnecting said data sources from said data processor means and disconnecting said external central computer means from said computer interface circuit means of said data acquisition and storage system, said display exerciser means including data recirculating means for causing the data retained in a storage location to be continuously recirculated for display on said display means during the subsequent occurrence of the corresponding display address, said display exerciser means further includes a simulation data generating means, and selecting means for operatively connecting either said data recirculating means for recirculating data from said storage means as input data to said data processor means for display on said display means, or connecting said simulation data generating means to said data processor means, said simulation data generating means being responsive to the display address of said data processor means for displaying said simulation data on said display means to determine the operational integrity of the data acquisition and storage system.

4,330,844

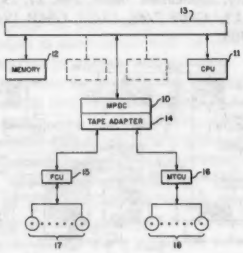
LOGIC TIMING SYSTEM FOR TAPE DEVICE ADAPTER

Joseph J. Dubuc, Yukon, Okla., assignor to Honeywell Information Systems Inc., Waltham, Mass.

Filed Dec. 12, 1979, Ser. No. 102,711

Int. Cl.³ G06F *3/00, 1/04*

U.S. Cl. 364—900 **5 Claims**



2. A logic timing system for controlling the flow rate of binary information streams through a tape device adapter which provides logic paths for the exchange of binary information between a peripheral device controller in electrical communication with a common communication bus of a data processing system, and plural magnetic tape device control units accommodating varying data formats, data densities, data processor code conventions and logic level conventions, wherein said tape device adapter includes both data packing logic means for accommodating varying data formats and densities, and adapter command register means responsive to control signals received from said peripheral device controller for identifying the data operation to be performed by said tape device adapter and selecting logic flow paths for binary information streams transferred through said tape device adapter, said logic timing system which comprises:

(a) logic input means in electrical communication with said plural magnetic tape device control units, said tape device adapter, and said peripheral device controller, and responsive to first logic control signals received from said plural magnetic tape device control units and said peripheral device controller for detecting the occurrence of a data transfer request, issuing a first timing control signal to cause said logic timing system to enter into a clear operation mode precedent to an information transfer, and issuing second logic control signals;

(b) clock frequency source means for providing a primary clock signal;

(c) logic synchronization means in electrical communication with said clock frequency source means and said logic input means, and responsive to said primary clock signal and to a first one of said second logic control signals indicating a pending information transfer for providing a second timing control signal synchronized with said pri-

mary clock signal to control the transfer of binary information through said tape device adapter;

(d) first clock frequency generation logic means in electrical communication with said clock frequency source means and responsive to said primary clock signal and to first logic data tracking signals for providing a first clock signal having a first frequency to said tape device adapter;

(e) second clock frequency generation logic means in electrical communication with said first clock frequency generation logic means, and responsive to said first clock signal for applying a phase shift to said first clock signal to provide a second clock signal;

(f) phase control logic means in electrical communication with said first clock frequency generation logic means, said second clock frequency generation logic means and said adapter command register means, and responsive to third logic control signals received from said adapter command register means which indicate the direction of flow of binary information in said tape device adapter and the data operation being performed by said tape device adpater for issuing fourth logic control signals, and third timing control signals to select one of said first clock signal and said second clock signal for application to said data packing logic means; and

(g) data tracking logic means in electrical communication with said phase control logic means, said logic input means, said logic synchronization means, said clock frequency source means, said first clock frequency generation logic means, said peripheral device controller, said adapter command register means and said data packing logic means, and responsive to said primary clock signal, to said third logic control signals, to a logic control signal received from said data packing logic means which indicates the progress of binary information being transferred through said tape device adapter, to a second one of said second logic control signals indicating one of plural data operations and to said fourth logic control signals for supplying said first logic data tracking signals to said first clock frequency generation logic means, and fifth logic control signals to said phase control logic means to cause said logic timing system to enter selectably into wait, normal and burst operation modes to synchronize the operation of said logic timing system with that of said plural magnetic tape device control units and said peripheral device controller.

4,330,845

GUESS-AHEAD FEATURE FOR A KEYBOARD-DISPLAY TERMINAL DATA INPUT SYSTEM

Frederick J. Damerau, Purdys, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 31, 1979, Ser. No. 108,774

Int. Cl.[3] G06F *3/02, 3/14, 7/34*

U.S. Cl. 364—900 **8 Claims**

1. In an interactive terminal system, including a keyboard, memory means and a display device wherein input data is entered into the system via the keyboard and displayed, the improvement in said system which comprises;

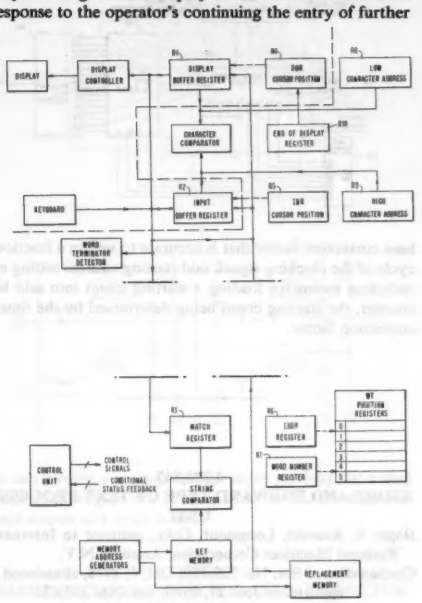
means for continually and dynamically evaluating the input data as a search argument to determine if it is the beginning of a string of data currently stored in a first section of the system memory,

wherein said means for evaluating includes means for comparing each new word entered into the system in combination with a predetermined maximum number of words immediately preceding said new word against a predetermined key list in said memory means, said key list comprising the initial words contained in a stored string and means operative to access the complete stored string in the event of a positive determination,

further means responsive to a positive determination by said evaluating means to cause the complete stored data string to be displayed on the display device,

means operative, upon a determination that the displayed string represents data which the terminal operator desires to enter into the system to cause said string, to be actually entered as data input into a second section of the system memory, and

alternative means in said evaluating means for continuing the entry of data via the keyboard and, for causing the displayed string on the display screen to be removed in response to the operator's continuing the entry of further



data without affirmatively indicating an acceptance of the displayed data and, including means for limiting the maximum number of words as the search argument which are considered for a key search, comprising means for determining that the maximum number of words has been entered into the system via the keyboard and for removing the oldest word as each new word is entered, thus dynamically changing the search argument.

4,330,846

DIGITAL TIME BASE CORRECTION

Joseph H. Colles, Oceanside; James A. Bixby, San Diego, and Gary A. Labeau, LaMesa, all of Calif., assignors to Eastman Technology, Inc., Rochester, N.Y.

Filed Jun. 16, 1980, Ser. No. 159,421

Int. Cl.[3] G11B *5/02*

U.S. Cl. 364—900 **6 Claims**

1. Apparatus for use in applying time base correction to an information signal that is stored in an addressable memory device, said apparatus including means for measuring a time base correction factor corresponding to the time disparity between said information signal and a time reference, said apparatus further comprising:

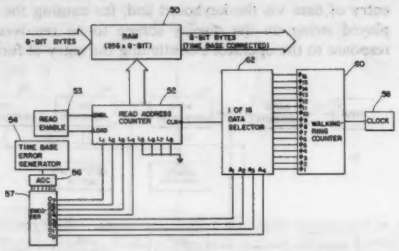
(a) means for producing a clocking signal;

(b) an address count generator that produces an address count for use in reading out the information signal from the addressable memory device, said address count being incrementable according to a predetermined sequence in response to the clocking signal;

(c) means for setting the starting address count of said address count generator based on the time base correction factor; and

(d) means for adjusting the phase of the clocking signal in response to the time base correction factor,

thereby beginning readout of the information signal from the addressable memory device at a time determined by the time



base correction factor that is accurate to within a fraction of a cycle of the clocking signal, said starting address setting means including means for loading a starting count into said binary counter, the starting count being determined by the time base correction factor.

4,330,847

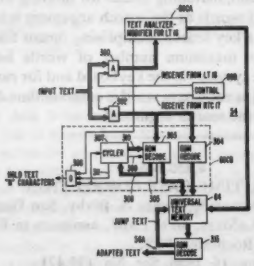
STORE AND FORWARD TYPE OF TEXT PROCESSING UNIT

Roger E. Kuseski, Longmont, Colo., assignor to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 729,460, Oct. 4, 1976, abandoned. This application Jun. 27, 1980, Ser. No. 163,673

Int. Cl.³ G06F *3/04, 7/34;* H04Q *11/04*

U.S. Cl. 364—900 **2 Claims**



1. A method for operating a message store-and-forward unit, coupled to a plurality of connected units, at least one of said connected units using at least one different text processing character signals from those used by said store-and-forward unit, comprising the steps of:

receiving a message from one of said connected units;

processing said received message by the steps of comparing each text processing character received to text processing characters performing the same function in all other connected units, and

inserting into said message all those text processing characters which perform the same function in all other connected units and which are different from the text processing character received; and

transmitting the processed message to one of said connected units.

4,330,848

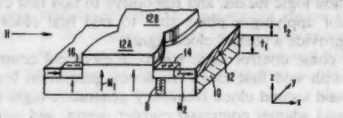
CHARGED WALL AMORPHOUS MAGNETIC LAYERS

Richard J. Gambino, Yorktown Heights, and Robert C. Taylor, Katonah, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 10, 1980, Ser. No. 129,006

Int. Cl.³ G11C *19/08*

U.S. Cl. 365—32 **15 Claims**



1. A magnetic bubble domain device for moving magnetic bubble domains in a bubble domain storage layer in response to the reorientation of a magnetic field, comprising in combination:

a magnetic bubble domain storage layer in which magnetic bubble domains can be propagated,

an amorphous magnetic drive layer adjacent to said magnetic storage layer for supporting stable and mobile magnetic charged walls which are coupled to bubble domains in said storage layer, and which move along patterned contiguous propagation elements formed in said amorphous drive layer as said magnetic field reorients in the plane of said drive layer, said drive layer being comprised of an amorphous ferrimagnetic material having a hard perpendicular anisotropy and substantially zero in-plane easy axis anisotropy, and

means for applying said reorienting magnetic field in the plane of said amorphous drive layer.

4,330,849

COMPLEMENTARY SEMICONDUCTOR MEMORY DEVICE

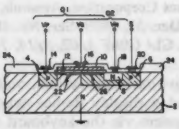
Ryoiku Togei, Machida, and Yoshihiko Hika, Yokohama, both of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

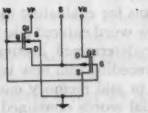
Continuation of Ser. No. 960,435, Nov. 13, 1978, abandoned. This application Aug. 27, 1980, Ser. No. 180,805

Claims priority, application Japan, Nov. 17, 1977, 52-138217

Int. Cl.³ G11C *11/40*

U.S. Cl. 365—181 **2 Claims**





1. A memory cell consisting essentially of two complementary metal-insulator-semiconductor (MIS) transistors integrated into a single semiconductor substrate with a single area

portion of a single insulated gate serving entirely as the gates of said two MIS transistors, each said cell further consisting of:

a semiconductor substrate having a first conductivity type, said substrate comprising the channel region of the first of said two MIS transistors,

first and second spaced regions of conductivity type opposite to that of said substrate, said first and second spaced regions and the intervening portion of said substrate corresponding to the first of said two MIS transistors,

a third region of the conductivity type of said substrate formed in said second region, said substrate and said second and third regions corresponding to the second of said two MIS transistors,

a gate insulating layer and a gate electrode forming said single gate, and extending between said first and third regions,

a field oxide layer extending into said substrate and having a configuration surrounding said third region except on the side of said third region on which said single gate is formed, said second and third regions both abutting at least in part horizontally with said first oxide along respective portions of the border of said field oxide around said cell, and no other portion of said field oxide being in contact with said third region,

said single gate electrode with said single gate area portion extending in a single solid pattern on the gate insulating layer from said first region to said third region, said gate electrode having a configuration corresponding to self-alignment with respect to said first and second regions to extend at least to some extent over said first and third regions,

said third region having a configuration corresponding to self-alignment with said respective portion of the border of said field oxide and said gate insulating layer, and said third size being of a minimum region for accommodating a single electrode contact thereto,

necessary corresponding electrodes for activating each of said first and third regions and for grounding said substrate, said second region being floating electrically, for changing the threshold voltage of said second MIS transistor as a result of charges transferred by said first MIS transistor and stored in said second region.

4,330,850

MNOS MEMORY CELL

Erwin Jacobs, Vaterstetten; Ulrich Schwabe, and Dezsoe Takacs, both of Munich, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Apr. 30, 1980, Ser. No. 146,392

Claims priority, application Fed. Rep. of Germany, May 10, 1979, 2918888

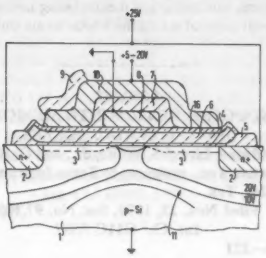
Int. Cl.³ G11C *11/40*

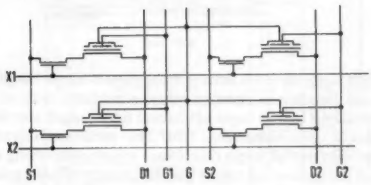
U.S. Cl. 365—185 **8 Claims**

1. In a memory cell comprised of a semiconductor substrate of a first conductivity type, said substrate having arranged in the surface thereof a plurality of MNOS components including source and drain zones of a second conductivity type opposite to that of said first conductivity type, and a multi-layer gate insulating layer which includes a gate electrode and covers a surface of said semiconductor substrate in the regions between said source and drain zones, the improvement comprising wherein

said gate electrode comprises first and second gate electrodes operable in different ways and which are superimposed one upon another (dual gate) and are connected via self-aligned overlapped contacts,

said second electrode being located above said first gate electrode and edges of said second gate electrode being arranged so as to be vertical relative to the plane of said semiconductor substrate surface and self-aligned to edges of said source and drain zones;





said cell having a storage nitride layer partially extending beyond the region of a channel zone toward the region of said source and drain zones.

4,330,851

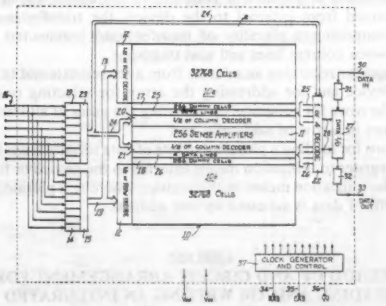
DYNAMIC DECODER INPUT FOR SEMICONDUCTOR MEMORY

Lionel S. White, Jr., Houston, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Mar. 21, 1980, Ser. No. 133,377

Int. Cl.³ G11C *11/40*

U.S. Cl. 365—202 **10 Claims**



1. A semiconductor memory device comprising an array of memory cells on a semiconductor body, cells in the array being connected to one of a plurality of select lines, a plurality of pairs of identical NOR gates, each NOR gate pair aligned with an adjacent pair of said select lines and including a plurality of input transistors each having a gate and a source, address input means for the memory device producing a first plurality of address voltages and complements thereof for a first plurality of input address bits, the address voltages and complements being connected to said gates and said sources in a plurality of

unique combinations for selection of one of the pairs of lines for a given combination of address, bits, and a second address bit produced by the address input means and connected to selection means, said selection means being connected to each of said adjacent pairs of select lines to activate only one of each pair.

4,330,852

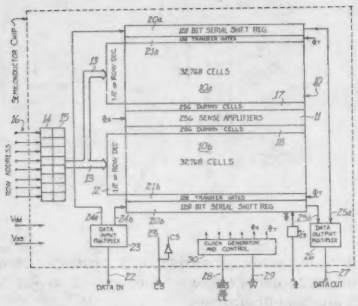
SEMICONDUCTOR READ/WRITE MEMORY ARRAY HAVING SERIAL ACCESS

Donald J. Redwine; Lionel S. White, Jr., and G. R. Mohan Rao, all of Houston, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Nov. 23, 1979, Ser. No. 97,105

Int. Cl.³ G11C *7/00*

U.S. Cl. 365—221 **7 Claims**



1. A semiconductor memory device fabricated in a single integrated semiconductor circuit, comprising:

an array of rows and columns of dynamic read/write one-transistor memory cells employing MOS transistors and capacitors, with a bistable sense amplifier circuit for each column for input or output of data,

a serial register having a plurality of stages, each stage associated with a selected one of said columns;

transfer means for loading bits of data from the columns into the register stages or from the register stages into the columns in parallel in response to a transfer signal received from external to the device, the transfer means comprising a plurality of transfer gates connected between column lines and said stages;

means for receiving an address from a source external to the device and for addressing the array for selecting one of the rows for actuation by actuating the gates of all transistors in a row of said cells; and

means for loading a plurality of bits of data serially from said register to utilization means external to the device or from the utilization means to the register whereby a plurality of bits of data is accessed by one address.

4,330,853

METHOD OF AND CIRCUIT ARRANGEMENT FOR READING AND/OR WRITING AN INTEGRATED SEMICONDUCTOR STORAGE WITH STORAGE CELLS IN MTL (I^2L) TECHNOLOGY

Helmut H. Heimeier, Herrenberg; Wielfried Klein, Holzerlingen; Erich Klink, and Friedrich C. Wernicke, both of Schoenaich, all of Fed. Rep. of Germany, assignors to International Business Machines Corporation, Armonk, N.Y.

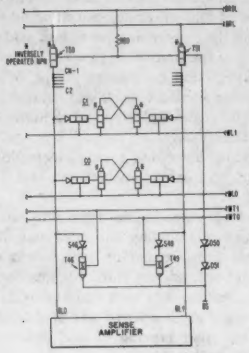
Filed Apr. 3, 1980, Ser. No. 136,859

Claims priority, application Fed. Rep. of Germany, Jun. 28, 1979, 2926050

Int. Cl.³ G11C *11/40*

U.S. Cl. 365—227 **15 Claims**

1. A method of reading and writing an integrated semiconductor store, said store having storage cells which consist of flip-flops with bipolar transistors in MTL technology, wherein line capacitances are discharged during or prior to a read and write operation, respectively, and a read/write circuit is provided, said method being characterized in that the current necessary for reading and/or writing the storage cells (C) is generated simply by discharging input capacitances (CE) of the non-selected storage cells and is fed directly to the selected storage cells (C) for reading and/or writing.



4,330,854

APPARATUS FOR GENERATING AN EXCHANGE PULSE TRAIN FOR USE IN A TELECOMMUNICATIONS SYSTEM

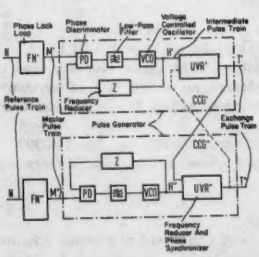
Rolf Zeitraeg, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Feb. 12, 1980, Ser. No. 120,910

Claims priority, application Fed. Rep. of Germany, Feb. 27, 1979, 2907608

Int. Cl.³ H04J *3/06*

U.S. Cl. 370—100 **7 Claims**



1. Apparatus for generating an exchange pulse train for use in a telecommunications system, said apparatus including duplicate generating arrangements each arranged to be servo-synchronised by means of a master pulse train which can be received at an input of each generating arrangement, the generating arrangements being arranged to operate alternatively so that, at any one time, one leads and produces a first exchange pulse train independently of the other, led generating arrangement, the other, led, generating arrangement being arranged to produce a second exchange pulse train which is synchronised to be substantially in phase with said first exchange pulse train; each of said generating arrangements comprising, in combination: (a) means for producing an intermediate pulse train whose period is less than or equal to a predetermined permitted maximum phase difference between said

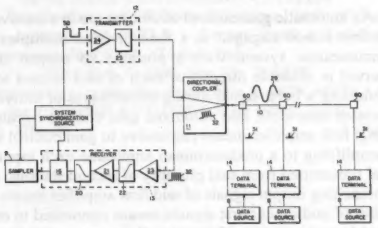
exchange pulse trains; (b) frequency reducer means, connected to receive said intermediate pulse train, for deriving therefrom the exchange pulse train of the respective one generating arrangement; (c) means, adapted to receive the exchange pulse train from the respective other generating arrangement and connected to said frequency reducer means, for comparing the two exchange pulse trains to detect when the phase difference between them exceeds a threshold value of the order of the intermediate pulse train period; and (d) means for advancing or retarding the exchange pulse train of said one generating arrangement by one intermediate pulse train period if such exchange pulse train is respectively lagging or leading in phase the exchange pulse train of said other generating arrangement by said threshold value.

4,330,855

APPARATUS FOR MULTIPLEXING DIGITAL SIGNALS

John T. Redfern, La Jolla, and Gary A. Dressel, San Diego, both of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Mar. 3, 1980, Ser. No. 126,588
Int. Cl.³ H04J *3/06*
U.S. Cl. 370—100 **9 Claims**



1. An apparatus for multiplexing digital signals, comprising:

at least one conducting means having two ends and a given length;

means for selectively receiving said digital signals, said receiving means connected to one end of said conducting means;

means for transmitting a synchronization signal comprised of a serial stream of equal coding periods, each of said coding periods consisting of one cycle of a periodic waveform, and each of said periods exceeding in duration the time required for a signal to be propagated through twice said length of said conducting means, said synchronization signal further comprised of an update period wherein said synchronization signal is quiescent, said transmitting means connected to the same end of said conducting means as said receiving means, said transmitting means comprising:

synchronous means connected between said transmitting means and said receiving means for providing said synchronization signal to said transmitting means, and for providing timing and control signals to said receiving means;

an amplifying means responsive to said synchronous means, for amplifying said synchronization signal; and

transmitter filter means for reducing interfering harmonics in said synchronization signal, said transmitter filter means connected between the output of said amplifying means and said conducting means; and

a plurality of data terminals connected to said conducting means in a spaced sequence, each of said terminals responding to said synchronization signal by transmitting a digital signal upon said conducting means during a coding period, the duration of said digital signal being relatively less than a coding period;

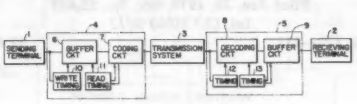
whereby said receiving means detects a serial stream or digital signals during a coding period in a time sequence corresponding to said spaced sequence of said data terminals.

4,330,856

DIGITAL SIGNAL TRANSMISSION SYSTEM INCLUDING MEANS FOR CONVERTING ASYNCHRONOUS SIGNALS TO THE OPERATING SPEED OF A TRANSMISSION LINE

Yoshitaka Takasaki, Tokorozawa, and Hiroki Yoshine, Machida, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 6, 1980, Ser. No. 118,919
Claims priority, application Japan, Feb. 19, 1979, 54/17341
Int. Cl.³ H04J *3/07*
U.S. Cl. 370—102 **13 Claims**



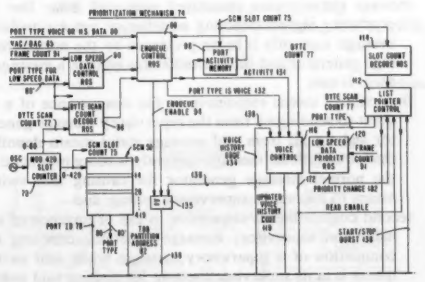
1. A digital signal transmission system wherein input digital signals are converted on a bit-by-bit basis into digital signals with a bit rate higher than that of the input digital signals by a signal format converter and then transmitted over a media having a given transmission speed, said signal format converter comprising a buffer circuit, writing means for writing the input signals into said buffer circuit at the bit rate of said input signals, reading means for reading out the written signals from said buffer circuit at a bit rate which is higher than that of said input signals and is equal to said transmission speed, and an encoder which discerns a mark and a space of the read signals and an empty representative of the non-existence of any signal to be read out and which, in case of the empty, inserts a dummy signal which is distinguishable from signals corresponding to the mark and the space by amplitude or pulse duration.

4,330,857

DYNAMICALLY VARIABLE PRIORITY, VARIABLE POSITION CHANNELS IN A TDMA BURST

Joseph A. Alvarez, III, Damascus; Joseph M. Bensadon, Germantown; John F. Brennen, Gaithersburg, and Robert W. Krug, Rockville, all of Md., assignors to IBM Corporation, Armonk, N.Y.

Filed Feb. 29, 1980, Ser. No. 126,076
Int. Cl.³ H04J *7/12*
U.S. Cl. 370—104 **8 Claims**



1. In a TDMA communication system, a method for increasing transmission bandwidth, comprising the steps of:

accumulating a first channel of data over a plurality of TDMA frames in a first buffer;

transferring said first channel of accumulated data to a second buffer for transmission;

accumulating a second channel of data in said first buffer;

deferring the transmission of said first channel of data when the transmission of higher priority data leaves insufficient capacity for transmitting said first channel while accumulating said second channel;

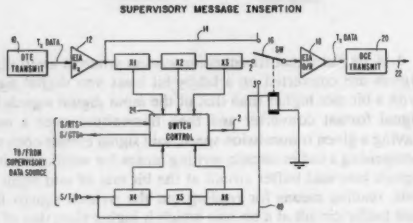
increasing the priority of said first channel of data above that for said higher priority data and transmitting said first channel when said accumulation of said second channel of data is completed.

4,330,858

TIME DOMAIN SUPERVISORY CHANNEL FOR DATA TERMINAL EQUIPMENTS

Michel F. Choquet, Saint Donat, France, assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 29, 1979, Ser. No. 53,487
Int. Cl.³ H04J 3/12
U.S. Cl. 370—111 **11 Claims**



1. In a digital data communication system wherein a common channel is used for carrying messages generated by both a normal message generator and a supervisory message generator, message insertion apparatus for enabling supervisory messages to enter said channel during intervals when no significant messages are being produced by said normal message generator, said apparatus comprising:

switch means having a normal setting for coupling the normal message generator to said channel, a supervisory setting for coupling the supervisory message generator to said channel; and said switch means also having an alternative setting in which it is effective to couple the normal message generator to said channel indirectly through said delay line,

a digital delay line for registering the output data which has been produced by said normal message generator during a time interval of limited duration preceding the current time;

message status means associated with said delay line for producing signals denoting whether or not a significant message currently is being produced by the normal message generator and the current status of such a message if there is one;

first control means responsive to the concurrence of a request-to-send signal from the supervisory message generator and signals from said message status means denoting that no significant message currently is being produced by the normal message generator for causing said switch means to assume its supervisory setting; and

second control means responsive to the occurrence of signals from supervisory message generator denoting the completion of a supervisory message while said switch means is in its supervisory setting for causing said switch means to assume its normal setting, and

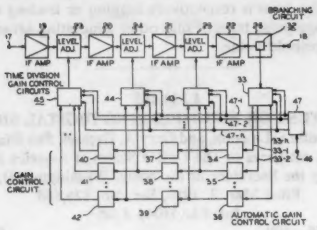
third control means responsive to signals from said message status means denoting that significant data currently is being produced by said normal message generator while said switch means is in its supervisory setting for changing the state of said switch means from its supervisory setting to said alternative setting thereof.

4,330,859

AUTOMATIC GAIN CONTROL CIRCUIT IN MULTI-DIRECTION TIME DIVISION MULTIPLEX COMMUNICATION SYSTEM

Masami Takada, Tokyo, Japan, assignor to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Sep. 19, 1979, Ser. No. 77,027
Claims priority, application Japan, Sep. 25, 1978, 53-116498
Int. Cl.³ H02K 47/04
U.S. Cl. 370—113 **4 Claims**



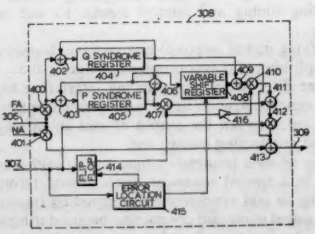
1. An automatic gain control circuit for use in a receiver unit of a first station engaged in a time division multiplex radio communication system with a plurality of second stations dispersed in multiple directions, each of said second stations transmitting a burst signal during occurrences of individually associated time slots, said automatic gain control circuit comprising: first amplifier means responsive to gain control signals for amplifying to a predetermined amplitude each input burst signal transmitted from said plurality of second stations; means for branching output signals of said first amplifier means into a number of said input burst signals; means connected to outputs of said branching means for gating them responsive to occurrences of time slot signals respectively assigned to said input burst signals; means for detecting the amplitude level of each gated signal; a plurality of second amplifier means for respectively amplifying the outputs of said detecting means; and means responsive to time period signals corresponding to respective bursts of said input burst signals for supplying to said first amplifier means selected outputs of said plurality of second amplifier means as said gain control signal.

4,330,860

ERROR CORRECTING DEVICE

Ryoichi Wada, Habikino; Mitsuharu Tsuchiya, and Seno Takanori, both of Katano, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Mar. 31, 1980, Ser. No. 136,456
Claims priority, application Japan, Mar. 30, 1979, 54-38751
Int. Cl.³ G06F 11/10
U.S. Cl. 371—37 **5 Claims**



1. An error correcting device used for an apparatus for correcting errors in a plurality of data units which each consist

of a plurality of bits constituting a set, wherein said apparatus receives said plurality of data and comprises: a first check code generator for generating a first check code by means of a modulo 2 operation of corresponding bits of a set of data, and a second check code generator for generating a second check code by means of a modulo 2 operation of corresponding bits of successively circulated or shifted results of said set of data, wherein said error correcting device, said set of data, said first check code and said second check code are fed to said error correcting device, and wherein said error correcting device comprises:

a pointer generating means for receiving said set of data, said first check code and said second check code and for generating a pointer signal that indicates erroneous data or check codes in said set of data being received;

an error signal generating means, coupled to said pointer generating means, for generating an error signal that indicates erroneous bits of said erroneous data; and

a data correcting means, coupled to said pointer generating means and to said error signal generating means, for correcting said erroneous data by means of said error signal.

4,330,861
DIGITAL EQUALIZER FOR SIGNAL RECEIVER IN QPSK DATA-TRANSMISSION SYSTEM

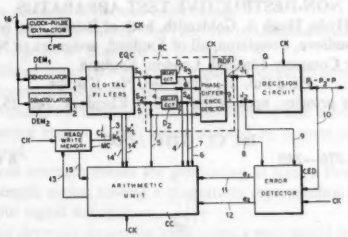
Enrico Impallomeni, and Roberto Montagna, both of Turin, Italy, assignors to CSELT - Centro Studi e Laboratori Telecomunicazioni S.p.A., Torino, Italy

Filed Nov. 6, 1980, Ser. No. 204,535

Claims priority, application Italy, Nov. 8, 1979, 69173 A/79

Int. Cl.³ H04B *3/14*; H03H *7/30*; H04L *25/03*

U.S. Cl. 375—15 **4 Claims**



1. An equalizer for a receiver of a data-transmission system operating with quadrature phase-shift keying, comprising:

noncoherent demodulation means connected to an incoming signal path for periodically producing digitized samples of in-phase and quadrature signal components during recurrent keying intervals;

digital filter means connected to said demodulation means for converting said digitized samples into filtered in-phase and quadrature samples with the aid of filtering coefficients stored in an associated memory;

delay means connected to said filter means for retarding the filtered in-phase and quadrature samples by one keying interval;

phase-comparison means with inputs connected across said delay means for producing in-phase and quadrature jump signals from phase differences between undelayed and delayed filtered samples;

decision means connected to said phase-comparison means for deriving quantized output signals from said in-phase and quadrature jump signals;

detection means connected across said decision means for generating in-phase and quadrature error signals from differences between said jump and output signals; and

arithmetic means with inputs connected to said filter means, said delay means and said detection means and with access to said memory for updating the stored filtering coefficients during each keying interval on the basis of said error signals, said undelayed and delayed filtered samples and ancillary data temporarily stored in said filter means.

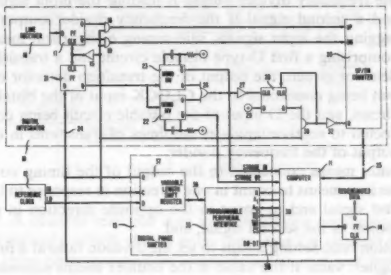
4,330,862
SIGNAL CHARACTERISTIC STATE DETECTOR USING INTERVAL-COUNT PROCESSING METHOD

Kenneth F. Smolik, Morristown, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Jul. 9, 1980, Ser. No. 167,383

Int. Cl.³ H04C *7/00, 27/22*

U.S. Cl. 375—75 **19 Claims**



1. In a system for receiving binary coded data signals having at least one predetermined characteristic, as well as having at least one signal level transition per symbol in a direction that is indicative of the binary information state of the symbol, the method for detecting the state of said predetermined characteristic of such data signals CHARACTERIZED BY the steps of

generating (10) binary coded words representing, respectively, for recurring symbol subintervals of predetermined length, the approximate proportion of each subinterval that the information signal state is in one of the binary signal states, and

processing (11) said words to detect the state of said characteristic in said signals.

4,330,863
DEMODULATOR ARRANGEMENT

Simon C. M. Wright, Ave. desGrives 3, Braine-l'Allend 1420, Belgium

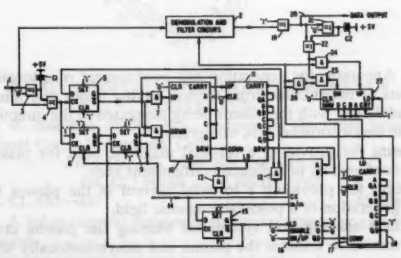
PCT No. PCT/GB79/00113, § 371 Date Mar. 7, 1980, § 102(e) Date Mar. 4, 1980

PCT Filed Jul. 5, 1979, Ser. No. 190,312

Claims priority, application United Kingdom, Jul. 7, 1978, 29121/78

Int. Cl.³ H03D *3/24, 3/22*

U.S. Cl. 375—81 **6 Claims**



1. A demodulator arrangement having a demodulator and a

digital phase locked loop responsive to input diphase digitally modulated signals to produce output signals which are applied to the demodulator for effecting the demodulation of the input signals, the phase locked loop including

a multiplicity of digital counting stages arranged as a variable frequency divider to produce a frequency-divided output from a clock signal, the division ratio of the frequency divider being settable to either, or any one, of at least two values,

a phase comparator arrangement to make repeated comparisons of the timing of transitions in the output of the frequency divider with the timing of transitions in the input signals, and to produce on each comparison a first signal if the frequency divider output is leading the input signals and a second signal if the frequency divider output is lagging the input signals, said timing comparison means comprising a first D-type bistable circuit and a transition detector circuit, the output of the transition detector circuit being connected to the CLOCK input of the bistable circuit, and the D input of the bistable circuit being connected to receive inputs at the times of transitions in the output of the frequency divider,

counter means connected to the output of the timing comparison means to count in one direction in response to the first signal and to count in the opposite direction in response to the second signal, and

division ratio setting means to set the division ratio at a first, higher, value if the value in the counter means exceeds a threshold in the one direction, and at a second lower value if the value in the counter means exceeds the threshold in the opposite direction,

wherein the arrangement includes a phase adjustment circuit responsive to the output of the demodulator and the output signals of the digital phase locked loop to correct the phase of the output signals of the phase locked loop.

4,330,864

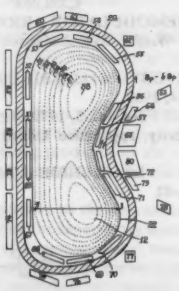
DOUBLE LAYER FIELD SHAPING SYSTEMS FOR TOROIDAL PLASMAS

Nobuyoshi Ohyabu, La Jolla, Calif., assignor to General Atomic Company, San Diego, Calif.

Filed Jun. 28, 1978, Ser. No. 919,799

Int. Cl.³ G21B 1/00

U.S. Cl. 376—133 **10 Claims**



1. Apparatus for generation and confinement of a toroidal plasma of noncircular cross section having major and minor toroidal axes, with the plasma being elongated in the direction of the major toroidal axis, comprising

means for providing a toroidal magnetic field for plasma confinement in a plasma confinement zone,

means for providing a toroidal current in the plasma for generation of a poloidal magnetic field,

a field shaping coil system for shaping the plasma cross section to stabilize the plasma and axisymmetrically with respect to the major toroidal axis to elongate the plasma in a direction along the major toroidal axis comprising an inner stabilizing coil system having a coil layer comprising a plurality of inner S coil elements aligned to conduct in a direction generally along the direction of the minor toroidal axis and disposed adjacent to and surrounding the plasma confinement zone with a physical contour generally corresponding to the desired elongated outer contour of the plasma, and an outer field shaping coil system having a coil layer comprising a plurality of outer coil elements aligned to conduct in a direction generally along the direction of the minor toroidal axis and being separated from the disposed exteriorly of the inner coil layer

the electrical currents I_S of said inner coil elements and the electrical currents I_F of said outer coil elements being related in each of the coil elements as follows:

$$\sum_j M^{ij}_{SS} I_S^j = -\sum_j M^{ij}_{SF}(I_F^j - \bar{I}_F^j)$$

where I_S^j is the current in the jth S coil element, I_F^j is the current in the jth F coil element, $\bar{I}_F^j$ is the current in the jth F coil element for which all S coil electrical currents are zero, M_{SF}^{ij} is the mutual inductance between the ith S coil element and the jth F coil element, and M_{SS}^{ij} is the mutual inductance between the ith S coil element and the jth S coil element and,

programming means for controlling the currents in the F coil elements of said outer coil layer to minimize the currents I_S^j in the S coil elements of the inner coil layer during plasma generation and confinement.

4,330,865

NON-DESTRUCTIVE TEST APPARATUS

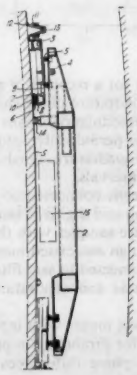
Eric A. Hyde; Hugh A. Goldsmith, both of Bristol, and Michael J. Proudlove, Congleton, all of England, assignors to Nuclear Power Company Limited, London, England

Filed Jul. 21, 1980, Ser. No. 170,594

Claims priority, application United Kingdom, Jul. 25, 1979, 7925967

Int. Cl.³ G21C 17/00

U.S. Cl. 376—249 **8 Claims**



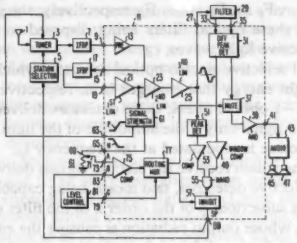
1. A vehicle for carrying non-destructive test instrumentation over a remote surface, the vehicle comprising a bridge structure having a plurality of support pads pivotably mounted thereon, each support pad having suction means for adhering the vehicle to an inclined or inverted surface and fluid thrust means arranged in opposition to the suction means to facilitate lateral sliding displacement of the vehicle, and a resiliently flexible tubular tie member for suspending the bridge structure and conducting fluid supplies thereto.

4,330,866

ARRANGEMENT FOR SELECTIVELY ROUTING A SIGNAL INDICATIVE OF RECEIVED SIGNAL STRENGTH TO DIFFERENT PORTIONS OF A RADIO RECEIVER IN RESPONSE TO DIFFERENT LEVELS OF A CONTROL SIGNAL

Max E. Malchow, Flemington, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Apr. 24, 1980, Ser. No. 143,503
Int. Cl.[3] H03J 7/18
U.S. Cl. 455—161 15 Claims



1. In a receiver receiving RF signals corresponding to respective stations, apparatus comprising:

tuning means for tuning said receiver to selected ones of said RF signals to generate an IF signal;

processing means for processing said IF signal to produce an information bearing output signal;

mute means for inhibiting the generation of said information bearing output signal, when enabled by a mute enabling signal;

a signal strength means for generating at least a first signal strength signal having a magnitude representing the RF input signal strength;

station detector means for generating a stop signal when IF signal has a predetermined condition indicating the tuning of one of said RF signals;

stop signal inhibit means for inhibiting the generation of said stop signal when enabled by a stop signal inhibit enabling signal;

comparator means having at least a first input for receiving a first input signal and an output for generating at said output an enabling signal when said first input signal has a first predetermined amplitude condition;

first connection means for applying one of said first signal strength signal and said stop signal to said first input of said comparator means as said first signal;

a source of a DC control signal which is independent of said RF signals; and

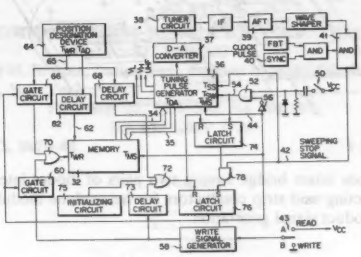
signal routing means for selectively routing said enabling signal to said mute means and stop signal inhibit means as the respective one of said mute enabling signal and said stop signal inhibit enabling signal in accordance with different levels of said control signal, said signal routing means at least routes said enabling signal to said stop signal inhibit means but does not route said enabling signal to said mute means in response to one level of said control signal and routes said enabling signal to said mute means but does not route said enabling signal to said inhibit means in response to a different level of said control signal.

4,330,867

CHANNEL SELECTION DATA MEMORY DEVICE

Masahiro Fujita, Kumagaya, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Apr. 7, 1980, Ser. No. 137,967
Claims priority, application Japan, Apr. 10, 1979, 54-43362
Int. Cl.[2] H04B 1/26
U.S. Cl. 455—186 6 Claims



1. A channel selection data memory device comprising:

a memory which allows pulse duty data for channel selection corresponding to channels to be read out from or written into said memory;

position designating means for designating a given address for application to said memory and which generates a first write signal when it is operated;

mode selection means for selecting a write mode in which the pulse duty data is written into said memory or a read mode in which the pulse duty data is read from said memory, said memory being responsive to said mode selection means;

tuning pulse generating means which produces a pulse signal with a duty corresponding to the channel selection pulse duty data read out from said memory in the read mode, and writes in said memory channel selection pulse duty data with a pulse duty corresponding to the channel to be stored in the write mode;

first write signal supply means for supplying to said memory said first write signal generated by said position designating means when it is operated;

write signal generating means for producing a second write signal when said mode selection means is turned to a read mode; and

second write signal supply means for supplying to said memory said second write signal from said write signal generating means.

4,330,868

BALUN COUPLED MICROWAVE FREQUENCY CONVERTER

Ben R. Hallford, Wylie, Tex., assignor to Rockwell International Corp., El Segundo, Calif.

Filed Dec. 15, 1980, Ser. No. 216,872
Int. Cl.[3] H04B 1/26; H03H 7/42
U.S. Cl. 455—327 45 Claims

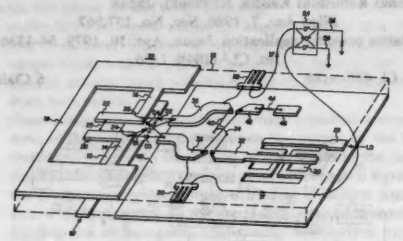
1. A balun coupled frequency converter comprising in combination:

first and second coplanar strip conductors;

a strip transmission line juxtaposed said first and second strip

conductors for interacting therewith to balun couple a field therebetween;

third and fourth coplanar strip conductors; and



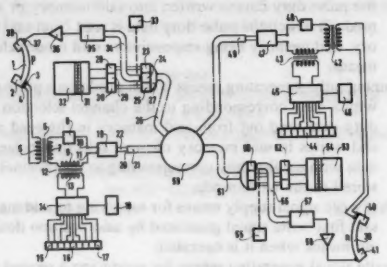
a diode mixer bridge having two pairs of diodes interconnecting said strip conductors for heterodyne modulation product signal generation.

4,330,869

SYSTEM OF OPTICAL TELEPHONY

Jean Robieux, Chatenay-Malabry, France, assignor to Societe Anonyme dite: Compagnie Generale d'Electricite, Paris, France

Filed Dec. 16, 1980, Ser. No. 217,080
Claims priority, application France, Dec. 28, 1979, 79 31979
Int. Cl.³ H04B 9/00
U.S. Cl. 455—607 **10 Claims**



1. A system of optical telephony which is capable of putting N subscribers in communication with one another, said arrangement including:

N telephone sets ascribed respectively to the N subscribers, each set including a microphone into which a subscriber speaks and which delivers in return an electric send signal, an earphone which receives an electric receive signal and which delivers in return an acoustic signal received by the subscriber, a laser generator which is capable of delivering a send light wave, means for modulating the amplitude of the send light wave by the frequency of said electric send signal, and a photoelectric receiver which receives a receive light wave and is capable of delivering in return said electric receive signal at whose frequency the amplitude of said receive light wave is modulated;

N pairs of optical fibres connected to respective ones of the telephone sets of the N subscribers, each pair including a send optical fibre and a receive optical fibre, a first end of the send optical fibre receiving said send light wave, the receiver optical fibre transmitting said receive light wave and delivering it at the second end of the send optical fibre to said photoelectric receiver; and

an interconnection centre to which said second ends of the N pairs of optical fibres are connected, wherein

said interconnection centre is a volume whose surface is formed at least partially by the surfaces of said second ends of the N pairs of optical fibres; and

wherein different optical frequencies $F_1 \ldots F_N$ are ascribed to respective subscribers, modulation frequencies $F_1 \ldots F_N$ which are different from one another being ascribed to respective subscribers, the modulation frequencies being lower than the optical frequencies;

subscriber p's laser generator delivers a send light wave of frequency F_p ascribed to subscriber p;

subscriber p's telephone set further includes:

means for modulating the amplitude of said send light wave of frequency F_p by the modulation frequency f_n ascribed to subscriber n;

N−1 optical filters capable of passing only frequencies $F_1 \ldots, F_{p-1}, F_{p+1} \ldots F_N$ respectively, the input of each of these optical filters being disposed to receive said receive light waves;

N−1 selective electro-optical detectors which receive the light energy that emerges from respective ones of the N−1 optical filters, these detectors delivering an electric signal only if the amplitude of the light energy they receive is modulated at the frequency f_p;

means which receive the electric signals delivered by said selective detectors, said means being capable of informing subscriber p of the order n of the filter of frequency F_n whose output radiation is causing the emission of an electric signal from the selective detector which receives said output radiation; and

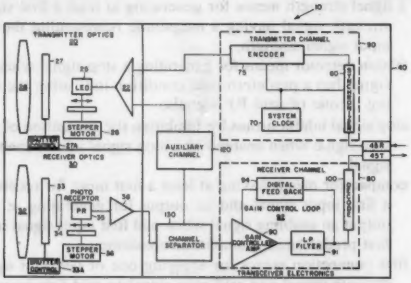
an optical conductor one of whose ends is disposed on the input surface of said photoelectric receiver and means for disposing the other end of said optical conductor on the output of said optical filter of frequency F_n.

4,330,870

OPTICAL DATA LINK

Thomas C. Arends, San Antonio, Tex., assignor to Datapoint Corporation, San Antonio, Tex.

Filed Sep. 5, 1980, Ser. No. 184,355
Int. Cl.³ H04B 9/00
U.S. Cl. 455—617 **6 Claims**



1. An optical data link for communicating information between two data facilities in which at least one includes a source or sources of information and the second a device or devices for utilizing the information, the optical data link comprising:

(a) an optical transmitter network including

first interface means coupled to receive electrical data signals from a data source(s),

a radiant energy source responsive to the data signals from said interface means to generate a modulated radiant energy output, and

first optical means for collimating the modulated radiant energy, said radiant energy source being positioned at the nominal focal point of such optical means;

(b) an optical receiver network aligned in spaced facing

relation to said optical transmitter network for receiving the modulated radiant energy including

second optical means for focusing the incident modulated radiant energy,

a photoreceptor positioned at the nominal focal point of said second optical means for converting the impinging modulated radiant energy into corresponding electrical data signals,

an amplifier network for amplifying the data signals from said photoreceptor, and

second interface means for coupling the amplified data signals to the utilization device(s); and

(c) signal level control means for controlling the signal level of the data signals coupled to the data utilization device(s) including

focal length correction means responsive to a temperature indication representative of ambient temperature to maintain said radiant energy source at the actual focal point of said first optical means, and to determine the actual focal point of said second optical means such that said photoreceptor is positionable at the actual focal point, thereby counteracting temperatue-induced focal length distortions,

electronic attenuation means in said amplifier network responsive to an electronic attenuation signal to selectively attenuate the output signal level from said amplifier network within a predetermined dynamic range of attenuation so as to achieve an optimum signal level for the data signals coupled to the data utilization device(s),

optical attenuation means responsive to an optical attenuation signal to selectively attenuate the modulated radiant energy incident on said photoreceptor by a predetermined amount,

signal level comparing means for comparing the output signal level from said amplifier network with a reference level corresponding to the optimum signal level and providing an appropriate electronic attenuation signal,

said signal level comparing means providing an appropriate optical attenuation signal if the dynamic range for said electronic attenuation means is exhausted without achieving the optimum signal level.

4,330,871

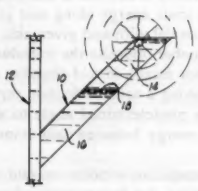
DETECTING SUBTERRANEAN HYDROCARBON ACCUMULATIONS

Robert K. Dyer, P.O. Box 533, Ada, Okla. 74820

Filed Oct. 20, 1980, Ser. No. 198,463

Int. Cl.³ G01V *1/13, 1/104*

U.S. Cl. 367—14 **6 Claims**



1. A method of detecting the presence and extent of a hydrocarbon accumulation in a subterranean formation comprising the steps of:

introducing a first gas into said formation having the property of being substantially unreactive with said formation and with water contained therein but forming an explosive mixture with hydrocarbons contained therein;

introducing a second gas into said formation having the property of being substantially unreactive with said formation and with water contained therein, but being explosively reactive with said first gas when in contact with a mixture of said first gas and hydrocarbons whereby said second gas contacts said first gas in said formation when mixed with hydrocarbons, said gas mixture autoignites and explodes thereby generating seismic waves which travel through the earth; and

detecting said seismic waves to thereby determine the presence and extent of a hydrocarbon accumulation in said subterranean formation.

4,330,872

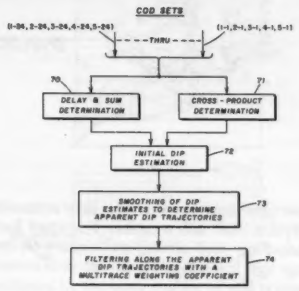
COMMON-OFFSET-DISTANCE SEISMIC TRACE FILTERING

Robert H. Bratton, Dallas, Tex., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Sep. 23, 1974, Ser. No. 508,597

Int. Cl.³ G01V *1/36*

U.S. Cl. 367—43 **4 Claims**



1. In seismic exploration wherein a multiple coverage exploration technique is used to obtain seismic traces from source and receiver positions along a line of exploration, the machine implemented method of enhancing the signal-to-noise ratio of said seismic traces, comprising the steps of:

(a) gathering said seismic traces into sets having common source-to-receiver offset distances,

(b) summing the magnitudes of the absolute values of a selected number of contiguous seismic traces along a first selected orientation for the dip trajectory across the seismic traces of each of said sets to obtain a sum-of-magnitude signal at each of a plurality of first sampling points within a first time window,

(c) summing the mutual products of the selected number of contiguous seismic traces along said first selected orientation for the dip trajectory of those portions of all possible trace pairs that lie within said first time window to obtain a cross-product signal for each of said plurality of first sampling points,

(d) repeating steps (b) and (c) for a plurality of selected orientations for the dip trajectory,

(e) incrementing said first time window along the time axis of said sets of traces and repeating steps (b)–(d) for each subsequent first time window position to obtain a plurality of sum-of-magnitude and cross-product signals,

(f) multiplying the sum-of-magnitude and cross-product signals obtained from the same first time window position and the same selected orientation for the dip trajectory to obtain a plurality of merit function signals,

(g) selecting the orientation for the dip trajectory associated with the largest value of the merit function signal for each first time window position as the initial dip estimate of the seismic reflection signal at the first sampling point that lies nearest the midpoint of the center trace within such first time window position,

(h) smoothing the initial dip estimates for each of said sets of common-offset-distance traces to provide final dip esti-

mates, the influence of erroneous dip estimates being thereby minimized, and

(i) filtering said sets of common-offset-distance traces along the apparent dips of the seismic reflection signals as indicated by said final dip estimates.

4,330,873

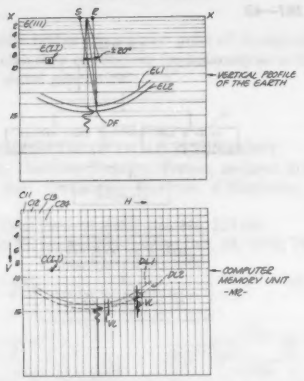
APLANATIC GEOPHYSICAL EXPLORATION SYSTEM

Raymond A. Peterson, Altadena, Calif., assignor to United Geophysical Corporation, Pasadena, Calif.

Continuation of Ser. No. 221,282, Jan. 27, 1972, abandoned, which is a continuation of Ser. No. 58,406, Jul. 27, 1970, abandoned. This application May 29, 1979, Ser. No. 43,052

Int. Cl.³ G01V *1/28*

U.S. Cl. 367—60 **15 Claims**



1. In a method of mapping the subsurface structures in a portion of the earth by processing seismic records with a general purpose digital computer having a control unit and having a memory unit comprising multistate memory cells in said control section and in said memory section, and utilizing a set of two-member doublets each of which is composed of a source and a receiver, at least one member of each doublet being different from either member of every other doublet, wherein seismic waves that are generated by the source of a doublet are received by the receiver of the doublet after the waves have traveled downwardly into the earth and have been deflected upwardly from various parts of the subsurface formations, and the doublet set has been exercised by exchanging either the source or the receiver or both from each doublet with those of another doublet, whereby with respect to each doublet a train of seismic waves is received as a function of time, and wherein position data are provided respecting the locations in the earth at which the members of the doublets were located during the generation and reception of the corresponding trains of seismic waves, the improvement comprising:

(a) the step of changing the states of some cells of the computer to establish a one-to-one correspondence between respective memory cells of the memory unit with various parts of the earth that includes formations from which such waves may have been deflected;

(b) developing electrical signals representing the position data of the sources and receivers;

(c) changing the states of some cells of the memory unit of the computer in accordance with said position data signals;

(d) the step of creating a series of digital electrical signals representative of the amplitude and sign of respective successive portions of the seismic wave train recorded with respect to such a doublet;

(e) the step of selecting sets of said cells in the memory unit, each of which memory cell sets respectively corresponds isochronically with the times of transmission of respective parts of the seismic waves from the source of said last mentioned doublet to such deflecting parts of the formation and thence to the receiver of such doublet, which parts occur at successive times in the received seismic wave train, taking into account the position data of the members of each of said doublets as well as the times of transmission of said parts of the seismic waves; and

(f) the step of establishing the states of cells in the control section of the computer to program the control to perform said steps (d) and (e) with respect to each of a series of such doublets to supply a digital replica of each such digital electrical signal in each series to the respective set of memory cells isochronic with respect to the respective digital signals in the respective doublets, and

(g) changing the states of the respective cells in the memory unit in accordance with the algebraic sums of the digital electrical signals supplied thereto, thereby aplanatically mapping said received waves in said memory unit to form a digital image of the structures from which such seismic waves have been received.

4,330,874

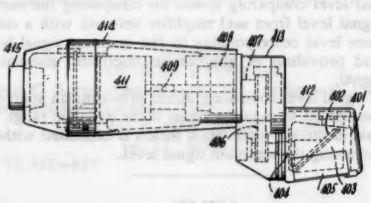
MECHANICAL SECTOR SCANNER HEAD AND POWER TRAIN

Jack R. Sorwick, Parker, Colo., assignor to Technicare Corporation, Solon, Ohio

Filed Aug. 15, 1980, Ser. No. 178,488

Int. Cl.³ G01S *15/02*; A61B *5/02*

U.S. Cl. 367—103 **6 Claims**



1. In an ultrasound imaging system, apparatus for developing a composite sector image along a given plane in the body of a subject comprising:

(a) a housing defining a chamber therein, having respective opposite ends on a given axis, and defining a side between said ends;

(b) a transducer affixed at one end of said chamber for generating and receiving sonic energy along said axis;

(c) shaft means, coaxial with said given axis, penetrating the end of said chamber opposite the transducer;

(d) a sonic reflector means, in said chamber attached to said shaft means, having a sonic reflection surface facing said transducer at a predetermined angle to said axis for deflecting sonic energy between said transducer and said side;

(e) a sonically transparent window on said side, adapted to engage the subject, for free passage of sonic energy between the subject and said reflector means;

(f) sonically conductive fluid filling said chamber;

(g) motive means, connected to said shaft, for oscillating movement of said reflector means; and

(h) wherein said housing further includes:

(i) a first, outboard portion, carrying said chamber;

(ii) a second, inboard portion, carrying said motive means; and

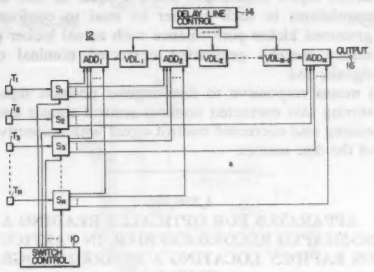
(iii) a third intermediate portion, carrying means for transfer of oscillatory motive force from said motive means in said second portion to said shaft in said first portion.

4,330,875

FOCUSING CIRCUIT FOR ULTRASOUND IMAGING SYSTEM

Ryobun Tachita, and Hiroshi Fukukita, both of Kawasaki, Japan, assignors to Matsushita Electric Industrial Company, Limited, Osaka, Japan

Filed Dec. 14, 1979, Ser. No. 103,478
Claims priority, application Japan, Dec. 19, 1978, 53-157317
Int. Cl.[3] G01S *9/66*
U.S. Cl. 367—105 4 Claims



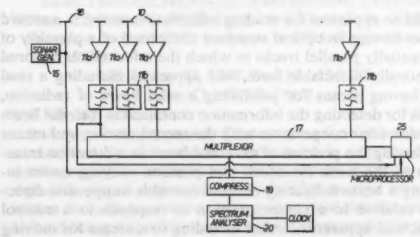
1. A variable delay type ultrasound imaging system having minimum total delay, comprising an array of transducers, a delay line means consisting of a single variable delay line having, in series, a plurality of summing junctions and variable delay elements between successive summing junctions, means for connecting any one of said transducers selectively to any one of said summing junctions and means for respectively controlling the amount of delay of said variable delay elements to provide focusing of said transducer array.

4,330,876

SONAR SYSTEMS

Phillip L. M. Johnson, Yeovil, England, assignor to Plessey Overseas Limited, Ilford, England

Filed Sep. 10, 1980, Ser. No. 185,739
Claims priority, application United Kingdom, Sep. 10, 1979, 7931306
Int. Cl.[3] G01S *15/06*
U.S. Cl. 367—105 15 Claims



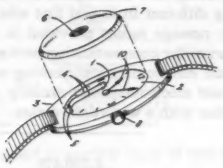
1. A sonar bearing determining system, comprising generating means for generating and radiating a sonar signal, receiving means comprising an array of spaced receiving transducers for receiving the sonar signal, modulating and sampling means comprising a multiplexer driven by a clock signal for multiplexing in accordance with a multiplexing frequency to produce a combined signal having a frequency component and being of the form of a repetitive sequential sample of each of the received signals modulated by a signal equal to the multiplexing frequency but phase displaced relative thereto, and determining means for determining, from the combined signal, a bearing indication in dependence upon the frequency component of the combined signal, wherein the multiplexer is arranged to selectively route samples of each of the received signals in turn to form said combined signal, whereby to effect both modulating and sampling functions.

4,330,877

ELECTRICALLY ILLUMINATED WRIST WATCH DIAL

Robert W. Barnes, 108 Deep Dale Dr. East, Levittown, Pa. 19056

Continuation of Ser. No. 24,694, Mar. 28, 1979, abandoned, which is a continuation-in-part of Ser. No. 518,341, Oct. 29, 1974, abandoned. This application Sep. 26, 1980, Ser. No. 191,149
Int. Cl.[3] G04B *19/30*
U.S. Cl. 368—67 5 Claims



1. In combination with a battery-operated wrist watch having an internal battery, a casing, a dial face, a crystal and a time-set stem, (a) a miniature electric bulb mechanically supported in position over the center of said dial face against, and without attachment to, the inner surface of said crystal so as to be capable of uniformly illuminating said dial face; (b) a pair of bulb support conductors, electrically connected to said bulb, said support conductors being in the form of spring metal wires with their ends opposite the bulb connections being attached and electrically insulated at the outer edge of the watch dial face and suitably shaped to follow the contour of the inner surface of said crystal so as to avoid interference between said spring wires and the watch hands; said spring wires being shaped and affixed to said dial face such that assembly of said crystal to the watch casing compresses said spring wires in toward said dial face to produce and maintain a positive spring-tension force between said watch crystal and said spring wires so as to maintain said bulb and said spring wires in proper position without attachment to said crystal regardless of the axes of positions to which the watch is normally subjected, so as to minimize vibration and shock bounce of said spring wires and said bulb; (c) a glare shield mounted above said bulb and suitably shaped to cover said bulb; (d) a manually actuated momentary electric switch of the normally open type for actuating said bulb to illuminate said dial face , wherein one of said bulb support conductors connects one side of said bulb to one terminal of said battery and the other bulb support conductor connects the second side of said bulb to one terminal of said switch; and (e) an electric lead connecting the second terminal of said switch to the second terminal of said battery, wherein said bulb, said switch and said battery are connected in series circuit when said switch is closed; said series circuit being in parallel connection to the electric operating circuit of said watch as relates to both circuits operating simultaneously from said battery.

4,330,878

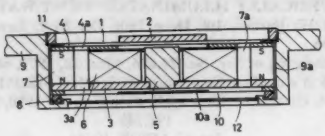
SOUND PRODUCING DEVICE FOR WATCHES

Seiichi Nakamura, Tokorozawa, Japan, assignor to Citizen Watch Co., Ltd., Tokyo, Japan

Filed Jun. 24, 1980, Ser. No. 162,498
Claims priority, application Japan, Jun. 26, 1979, 54-80425
Int. Cl.[3] G04C *2/16*
U.S. Cl. 368—250 5 Claims

1. A sound producing device for a watch having a watch

case, comprising: an electromagnetic exciting means including a coil and a magnetic member, a first vibration plate provided adjacent one side of said electromagnetic exciting means, said first vibration plate being adapted to be vibrated by the magnetic force generated by said electromagnetic exciting means; a second vibration plate provided adjacent the other side of



said electromagnetic exciting means, said second vibration plate being different from said first vibration plate in natural frequency; passage means provided in said electromagnetic exciting means for communicating between spaces on opposite sides of said electromagnetic exciting means, and means for securing said electromagnetic exciting means to said watch case together with a watertight means.

4,330,879

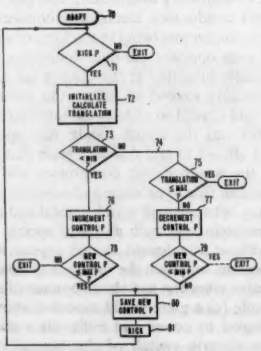
ADAPTIVE STYLUS KICKER USING DISC TRACK AND DISC SECTOR INFORMATION

Charles M. Wine, Princeton, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Oct. 18, 1979, Ser. No. 86,245

Int. Cl.³ G11B *17/22, 9/00*

U.S. Cl. 369—32 **7 Claims**



1. An improved video disc player system for recovering recorded information from disc records having information bearing tacks, said information including track identification signals and disc angular position signals corresponding to pie-shaped sectors of said disc records, said system having a signal pickup stylus mounted to one end of a stylus arm, the other end thereof mounted to a carriage for translation of the stylus radially across said disc record at a substantially uniform rate and having a kicker apparatus mounted in said carriage for selectively imparting limited translation of the stylus radially across said disc, said kicker apparatus being energized by a programmable pulse generator producing drive signals dependent on control signals applied thereto, wherein the improvement resides in circuitry for generating sector dependent control signals for producing stylus translation calibrated to a disc being played, said improvement comprising:

circuitry connected to said signal pickup stylus for generating a substantially digital signal responsive to said disc record track identification and disc angular position signals; and

control circuitry responsive to said digital signal for generating control signals including,

(a) means programmed to produce respective nominal control signals and thereby induce nominal stylus translations in said disc sectors;

(b) means for comparing successive track identification signals to determine whether respective programmed kicker produced stylus translations equal said nominal stylus translations;

(c) means for adjusting by increments said nominal control signals when said respective programmed kicker produced stylus translations are not equal to said nominal translations in such manner to tend to conform programmed kicker performance with actual kicker performance thereby generating corrected nominal control signals; and

(d) means responsive to disc angular position signals for storing said corrected nominal control signals and associating said corrected control signal with respective ones of the disc sectors.

4,330,880

APPARATUS FOR OPTICALLY READING A DISC-SHAPED RECORD CARRIER, IN PARTICULAR FOR RAPIDLY LOCATING A DESIRED PROGRAM SECTION

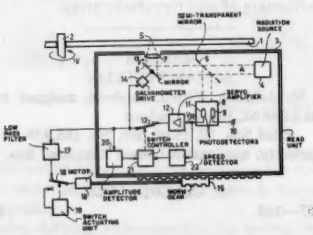
Ate Van Dijk, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 20,375, Mar. 14, 1979, abandoned. This application Jun. 27, 1980, Ser. No. 163,769

Claims priority, application Netherlands, Dec. 13, 1978, 7812111

Int. Cl.³ H04N *5/84;* G11B *7/00*

U.S. Cl. 369—32 **8 Claims**



1. In an apparatus for reading information stored in a record carrier having an optical structure comprised of a plurality of substantially parallel tracks in which the information is stored in optically detectable form, said apparatus including a read unit having means for producing a read beam of radiation, means for detecting the information contained in the read beam radiation after cooperation with the record carrier, and means for varying the position of said read beam in a direction transverse to the track direction, said position varying means including a beam deflecting element movable in opposite directions relative to a center position in response to a control signal, said apparatus further including first means for moving said read unit in a direction normal to the track direction and a servo control loop for controlling the position of said beam in said transverse direction, said control loop including said deflecting element and means for measuring the deviation of said read beam in a direction transverse to the track direction relative to a desired track and for deriving therefrom said control signal, the improvement comprising means for supplying a first signal when the movement of said deflection element in one of said two directions relative to said center position exceeds a predetermined value, means coupled to said suppling means for rendering said servo loop inoperative upon appearance of said first signal, and second means for moving said deflection element in the other of said two directions through said center

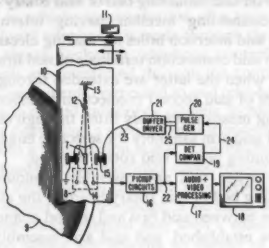
position upon appearance of said first signal, and second means for rendering said servo loop operative when said deflection element moves past said center position.

4,330,881

VIDEO DISC APPARATUS FOR CLEARING FOREIGN MATTER FROM THE SIGNAL PICKUP STYLUS DURING PLAYBACK

Richard W. Nosker, Princeton, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Mar. 7, 1980, Ser. No. 128,234
Int. Cl.[3] G11B 3/58
U.S. Cl. 369—50 7 Claims



1. In a video disc system of the type wherein prerecorded information is retrieved from a disc record by a signal pickup stylus, said signal pickup stylus being subject to accumulating foreign material thereon during playback, apparatus for removing said foreign material from the signal pickup stylus comprising:

first means responsive to a predetermined degradation of the recovered information signal for generating a control signal;

second means responsive to said control signal for generating a predetermined pulse sequence; and

transducer means operatively coupled to the signal pickup stylus, said transducer being responsive to the predetermined pulse sequence for deflecting the signal pickup stylus in a manner causing the dislodging of said foreign material from the pickup stylus.

4,330,882

APPARATUS FOR MONITORING A WIDEBAND ELECTROMECHANICAL RECORDING SYSTEM

Wilber C. Stewart, Hightstown, and Gerard A. Alphonse, Princeton, both of N.J., assignors to RCA Corporation, New York, N.Y.

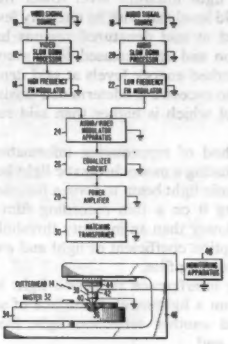
Filed May 30, 1980, Ser. No. 154,765
Int. Cl.[3] G11B 27/36
U.S. Cl. 369—55 7 Claims

1. A monitoring apparatus for measuring the displacement of a wideband electromechanical cutterhead in a system for recording signals in a disc master; the frequency spectrum of said signals having a region of relatively high energy level, said system including a source for supplying said signals, said cutterhead being responsive to said signals for recording representations of said signals in said disc master when relative motion is established therebetween; means for applying said signals to said cutterhead to cause the cutterhead to undergo vibrations in response to said signals; said apparatus comprising:

a first signal branch connected between said source of signals and a point of reference potential which includes said cutterhead; said cutterhead having an electrical equivalent circuit which is substantially represented by a series resonant circuit in shunt with a capacitive element; the signal which flows through said series resonant circuit being representative of the mechanical characteristics of said cutterhead;

a second signal branch, connected in parallel with said first signal branch between said source of signals and said point of reference potential, having a variable circuit element included therein; and

a differential amplifier, said first signal branch coupled to a first input terminal of said differential amplifier and said



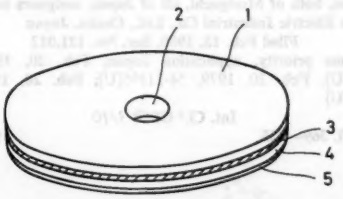
second signal coupled to another input of said differential amplifier, for differentially combining the signal from said first signal branch with the signal from said second signal branch; the signal output from said differential amplifier being a substantial representation of the signal which flows through said series resonant circuit.

4,330,883

SYSTEM AND METHOD OF OPTICAL INFORMATION STORAGE IN A RECORDING DISC

Takeo Ohta, Nara; Nobuo Akahira, Yahata; Tatsushi Nakamura, Neyagawa, and Tadaoki Yamashita, Hirakata, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Sep. 18, 1979, Ser. No. 76,725
Claims priority, application Japan, Sep. 25, 1978, 53-118468
Int. Cl.[3] G11B 7/00
U.S. Cl. 369—100 19 Claims



1. A method of erasing information optically recorded in a thin recording film in the form of a distribution of thermally denatured regions therein on a recording disc substrate comprising the steps of

producing a monochromatic light beam,

focussing said monochromatic light beam to form a focussed light spot beam on said thin recording film,

sweeping said focussed light spot beam relative to and on a front surface of said thin recording film with a light intensity that light absorption in said thermally denatured regions gives a higher energy level than a recording intensity threshold level for having changed a light absorption coefficient and a refractive index of non-denatured regions in said thin recording film, and

applying said focussed light spot beam on said thin recording film, thereby producing an apparent reflection from said

thin recording film resulting from an interference between reflection light from a light-incident face of said thin recording film and another reflection light from a bottom face thereof which is smaller at said denatured regions than at said non-denatured regions,

the applying of said focussed light spot beam being done with a light intensity level lower than said recording threshold level and with an intensity level such that, when absorbed at said denatured regions having a decreased reflection and an increased light absorption coefficient, the absorbed energy levels at said denatured regions are caused to exceed a predetermined erasing intensity threshold level which is higher than said recording threshold level.

4. A method of reproducing information comprising the steps of producing a monochromatic light beam, focussing said monochromatic light beam to form a focussed light spot beam, and sweeping it on a thin recording film with an intensity sufficiently lower than an intensity threshold level for changing an absorption coefficient of light and a refractive index of said thin recording film,

producing interference reflection light between reflection light from a light-incident surface of said thin recording film and another reflection light from a bottom face thereof, and

transducing said interference reflection light photoelectrically thereby generating an electric signal.

7. A method of recording information in a thin recording film comprising the steps of modulating an intensity of a monochromatic light beam by information data in a manner that the modulated monochromatic light beam has at least a higher level part in time sequence so as to produce thermally denatured regions in said thin recording film, focussing said modulated light beam to form a focussed light spot beam on said thin recording film, said sweeping said focussed light spot beam on said thin recording film, thereby changing a light absorption coefficient and a refractive index at stimulation by said focussed light spot beam irradiation with an intensity which is higher than an intensity threshold level for changing said light absorption coefficient and said refractive index.

4,330,884
PICKUP ARM DEVICE

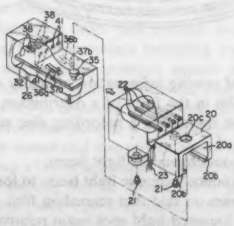
Shuichi Obata, Kyoto; Hiroshi Yasuda, and Yukihiro Fukushima, both of Moriguchi, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Feb. 13, 1980, Ser. No. 121,012

Claims priority, application Japan, Feb. 20, 1979, 54-21393[U]; Feb. 20, 1979, 54-21395[U]; Feb. 20, 1979, 54-21396[U]

Int. Cl.³ G11B *3/10*

U.S. Cl. 369—255 **9 Claims**



1. A pickup arm device which comprises

(a) a rotary bearing having a mounting bed rotatable about the horizontal and vertical axis mounted thereon;

(b) an arm assembly having adjacent one end thereof a cartridge mounting head shell, and adjacent the other end thereof a balancing weight assembly and a mounting means between the ends thereof which is adapted to be removably engaged with the mounting bed of said rotary bearing,

(c) a first connecting member mounted on said mounting means of said arm assembly and provided with connection terminals which are electrically connected to the output lines from a cartridge and are extended in the direction in which the mounting means of said arm assembly is engaged with the mounting bed of said rotary bearing;

(d) a second connecting member adapted to engage said first connecting member, said second connecting member being mounted on said mounting bed of said rotary bearing and formed with insertion holes into which said connection terminals of said first connecting member extend when said mounting means of said arm assembly is mounted on said mounting bed of said rotary bearing, said second connecting member having internal terminals adjacent said insertion holes for making electrical connection with said connection terminals of said first connecting member when the latter are extended through said insertion holes of said second connection member; and

(e) a locking means threadably fitted through said mounting means of said arm assembly for selective engagement with said mounting bed of said rotary bearing;

whereby when said arm assembly is mounted on said mounting bed of said rotary bearing, the electrical connection between said first and second connecting means may be established, and said arm assembly can be securely held to said rotary bearing.

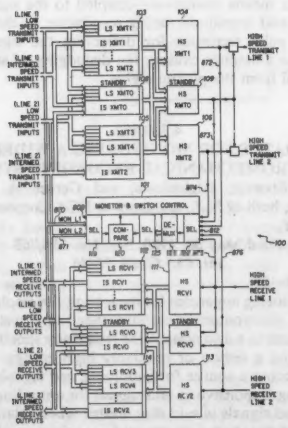
4,330,885
PROTECTED MULDEM WITH IMPROVED MONITORING SYSTEM AND ERROR DETECTION

Ned E. Abbott, McKinney; Hampapur R. Keshavan, Dallas, and Robert J. McGuire, Richardson, all of Tex., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Jun. 3, 1980, Ser. No. 155,983

Int. Cl.³ H04J *3/14*

U.S. Cl. 370—17 **71 Claims**



1. A multiplexer with an improved monitoring system for the detection of malfunctions, comprising in combination:

a plurality of parallel data input groups;

transmission means multiplexing said data input groups for serial transmission of high speed data; and

monitor means testing active data paths through said multiplexer for detection of malfunctions in said multiplexer, said monitor means having a first threshold error rate indicative of a malfunction and a second, lower threshold error rate indicative of a corrected malfunction.

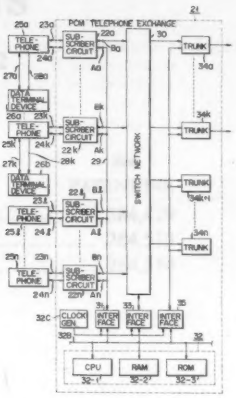
4,330,886

AUTOMATIC TELEPHONE EXCHANGE SYSTEM FOR BOTH SPEECH SIGNALS AND DATA TRANSFER

Takeo Fukuda; Kazuhiko Hanawa, both of Yokohama, and Kiyoshi Urui, Tokyo, all of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan

Continuation of Ser. No. 898,986, Apr. 21, 1978, abandoned.
This application Jun. 23, 1980, Ser. No. 162,205
Claims priority, application Japan, Apr. 22, 1977, 52/46604
Int. Cl.³ H04M *11/00;* H04Q *11/04*
U.S. Cl. 370—62 **2 Claims**

2. An automatic telephone exchange system comprising: a telephone exchange including a switch network, and a plurality of subscriber circuits; telephones connected to said switch network through speech lines, control lines and said subscriber circuits, and in which communication of a speech signal between two of said telephones is made through the speech lines and control signals including telephone control signals and function signals are transferred through the control lines; and data terminal equipments connected to said telephones through data lines; each of said subscriber circuits including an A/D convertor for converting a speech signal transferred through a speech line into a transmission signal, a distributing circuit for separating a time-division-multiplex signal transferred through a control line into terminal data of a data terminal equipment and control signals of a telephone, a terminal data insertion circuit for combining terminal data with a speech signal at a predetermined timing and sending an output of the terminal data insertion circuit to said switch network, a signal transmission circuit for transmitting a control signal separated by said distributing circuit, a terminal data deriving circuit for separating the speech signal and terminal data from an output transmission signal exchanged and controlled by said switch network, means for converting the speech signal separated by said deriving circuit into an analogue signal and for delivering the analogue signal to the speech line, means for time-division-



multiplexing the terminal data separated by said terminal data deriving circuit, a control signal and a clock signal, and means for delivering multiplexed data to the control lines.

DESIGN PATENTS

GRANTED MAY 18, 1982

ERRATA

For CLASS	See PATENT NO.
D08–385	264,429
D34–043	264,513
D34–045	264,514

DESIGN PATENTS

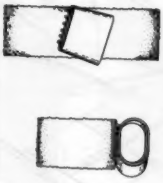
GRANTED MAY 18, 1982

ERRATA

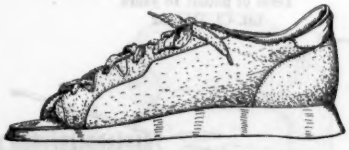
Pat.	Dec.
CLASS	PATENT NO.
D28–315	264,429
D34–041	264,513
D34–042	264,514

264,390
HAMBURGER BUN
Thomas H. Long, and Winifred L. Reddick, both of P.O. Box 153, Paradise, Calif. 95969
Filed Aug. 14, 1979, Ser. No. 66,508
Term of patent 14 years
Int. Cl. D01—*01*
U.S. Cl. D1—16

264,391
COMBINED HEADBAND AND FLASHLIGHT HOLDER
Robert B. Schweitzer, 1501 Palm Ave., Richmond, Calif. 94805
Filed Aug. 13, 1979, Ser. No. 66,005
Term of patent 14 years
Int. Cl. D02—*03*
U.S. Cl. D2—230

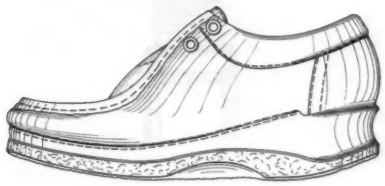


264,392
ATHLETIC SHOE
Graeme K. Lydiard, Auckland, New Zealand, assignor to Lydiard Shoe Company Limited, Auckland, New Zealand
Filed Apr. 8, 1980, Ser. No. 138,857
Claims priority, application New Zealand, Oct. 19, 1979, 16293
Term of patent 14 years
Int. Cl. D2—*04*
U.S. Cl. D2—309



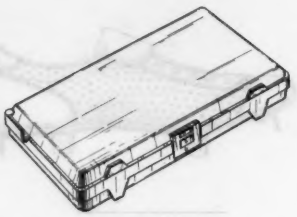
264,393
ATHLETIC SHOE
Kyozo Sasaki, Ashiya, Japan, assignor to Sasaki Co., Ltd., Osaka, Japan
Filed Nov. 27, 1979, Ser. No. 98,192
Claims priority, application Japan, Jul. 16, 1979, 54-29743
Term of patent 14 years
Int. Cl. D2—*04*
U.S. Cl. D2—311

264,394
MOCCASIN SHOE
John F. Hlustik, London, England, assignor to The United States Shoe Corporation, Cincinnati, Ohio
Filed Feb. 12, 1979, Ser. No. 11,727
Claims priority, application United Kingdom, Dec. 29, 1978, 987884
Term of patent 14 years
Int. Cl. D2—*04*
U.S. Cl. D2—312

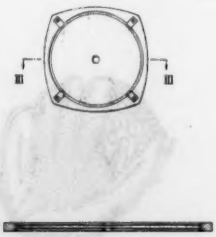


264,395
BASEBALL GLOVE
Kyozo Sasaki, Ashiya, Japan, assignor to Sasaki Co., Ltd., Osaka, Japan
Filed Nov. 27, 1979, Ser. No. 98,193
Claims priority, application Japan, Nov. 8, 1979, 54-47030
Term of patent 14 years
Int. Cl. D2—*06*
U.S. Cl. D2—361

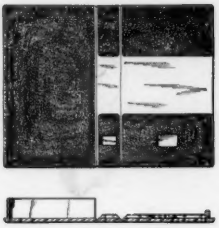
264,396
CONTAINER FOR A PORTABLE COMPRESSOR
Gerald J. Harvey, Woodmere, and Elliot Huff, Jr., St. James, both of N.Y., assignors to Harvey-Westbury Corp., Westbury, N.Y.
Filed Oct. 22, 1979, Ser. No. 86,747
Term of patent 14 years
Int. Cl. D3—*02*
U.S. Cl. D3—30.1



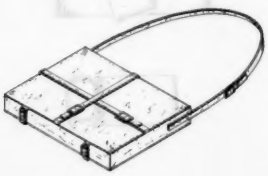
264,397
RECORD DISC PACKAGE
Makoto Fujita, Kadoma; Izumi Hino, Daito, and Shoji Ohmiya, Shijonawate, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed Mar. 14, 1979, Ser. No. 20,631
Claims priority, application Japan, Sep. 26, 1978, 53-41201
Term of patent 14 years
Int. Cl. D14—*01;* D3—*02*
U.S. Cl. D3—35



264,398
VIDEO CASSETTE STORAGE CONTAINER
Robert A. Basili, Waldwick, N.J.; Gerald Weinstein, Brooklyn, N.Y., and William B. Wilson, Middlesex, N.J., assignors to Plastic Reel Corporation of America, Wood Ridge, N.J.
Filed May 27, 1980, Ser. No. 153,555
Term of patent 14 years
Int. Cl. D3—*02*
U.S. Cl. D3—35

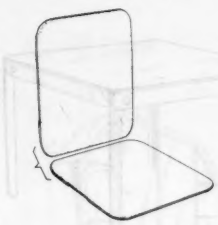


264,399
CARRYING CASE FOR ARTIST'S MATERIALS OR THE LIKE
Thomas Koves, 645 N. Cherokee St., Los Angeles, Calif. 90004
Continuation-in-part of Ser. No. 76,593, Sep. 18, 1979, Pat. No. Des. 260,324. This application Apr. 28, 1980, Ser. No. 144,415
Term of patent 14 years
Int. Cl. D3—*02*
U.S. Cl. D3—42

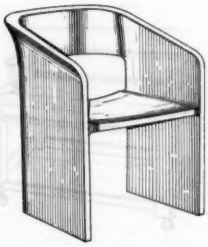


264,400
HAIRBRUSH OR SIMILAR ARTICLE
Franz Arnold, Triengen, Switzerland, assignor to Trisa Bürstenfabrik AG Triengen, Triengen, Switzerland
Filed Aug. 8, 1979, Ser. No. 64,876
Claims priority, application World Intel. Prop. Org., Feb. 12, 1979, 68293
Term of patent 14 years
Int. Cl. D4—*02*
U.S. Cl. D4—35

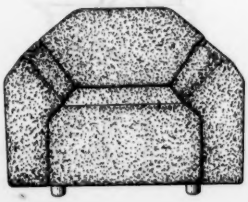
264,401
SEAT CUSHION COVER
Herbert H. Trotman, and Helen H. Trotman, both of P.O. Box 807, Virginia Beach, Va. 23451
Filed Oct. 5, 1979, Ser. No. 82,273
Term of patent 14 years
Int. Cl. D6—*99*
U.S. Cl. D6—48



264,402
CHAIR
John Yellen, 111 4th Ave., New York, N.Y. 10003
Filed Jan. 14, 1980, Ser. No. 111,758
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—70

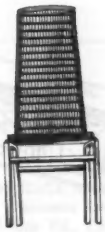


264,403
CHAIR
Roger L. Webb, London, England, assignor to Antocks Lairn Limited, London, England
Filed Mar. 12, 1980, Ser. No. 129,757
Claims priority, application United Kingdom, Sep. 14, 1979, 991575
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—71

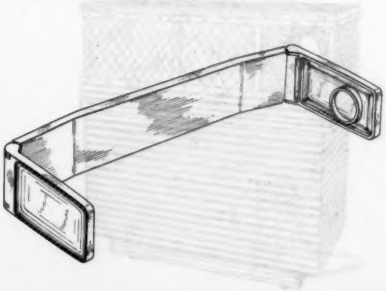


264,404
RECLINING CHAIR
Reji Sato, Tokyo, Japan, assignor to Sugatsune Industrial Co. Ltd., Tokyo, Japan
Filed Sep. 14, 1978, Ser. No. 942,397
Claims priority, application Japan, Jun. 15, 1978, 53-24933
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—73

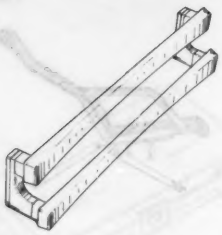
264,405
STACKABLE CHAIR OR THE LIKE
Joseph E. Adkinson, 3807 Leland St., Chevy Chase, Md. 20015
Filed Aug. 28, 1979, Ser. No. 70,444
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—76



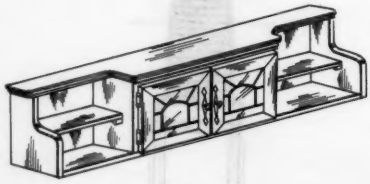
264,406
PAPER TOWEL HOLDER
John Arnott, 36 Wellington St. E., Toronto, Ontario, Canada M5E 1C7
Filed Jun. 9, 1980, Ser. No. 157,604
Claims priority, application Canada, Dec. 14, 1979, 1412797
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—96



264,407
TOWEL RAIL
Bruce R. Thompson, Tranmere, Australia, assignor to UPL Group Limited, Brisbane, Australia
Filed Feb. 13, 1980, Ser. No. 121,241
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D6—99



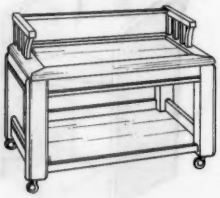
264,408
WALL MOUNTED COSMETIC CABINET
James J. Palka, Arlington Heights, Ill., assignor to Pace Industries Inc., Chicago, Ill.
Filed Jan. 19, 1981, Ser. No. 226,237
Term of patent 7 years
Int. Cl. D06—*04*
U.S. Cl. D6—127



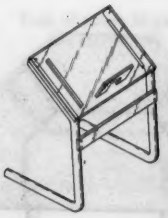
264,409
SEAFOOD DISPLAY CASE
Robert R. Wakefield, 62 Hobart St., South Portland, Me. 04106
Filed Nov. 20, 1978, Ser. No. 962,388
Term of patent 14 years
Int. Cl. D20—*02*
U.S. Cl. D6—153

264,410
TABLE
Gerd Lange, Kapsweyer, Fed. Rep. of Germany, assignor to Schlapp Moebel GmbH & Co. KG, Neu-Anspach, Fed. Rep. of Germany
Filed Mar. 20, 1979, Ser. No. 22,154
Claims priority, application Fed. Rep. of Germany, Sep. 22, 1978, 59
Term of patent 14 years
Int. Cl. D6—*03*
U.S. Cl. D6—177

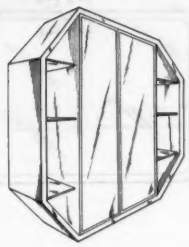
264,411
TABLE
Samuel T. Collins, Bassett, Va., assignor to Trend Line Furniture Corporation, Amsterdam, N.Y.
Filed Apr. 13, 1979, Ser. No. 29,818
Term of patent 14 years
Int. Cl. D6—*03*
U.S. Cl. D6—179



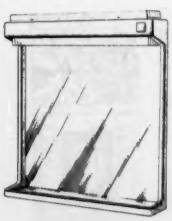
264,412
SUPPORT FOR BOOKS AND THE LIKE
Adrian S. Vega, Sol St. No. 82, Guayama, P.R.
Filed Dec. 7, 1979, Ser. No. 101,530
Term of patent 14 years
Int. Cl. D6—*03*
U.S. Cl. D6—180



264,413
COMBINED STORAGE AND DISPLAY UNIT
James Di Persia, New York, N.Y., assignor to Avento Designs Inc., New York, N.Y.
Filed Dec. 14, 1979, Ser. No. 103,953
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—186



264,414
ILLUMINATED MIRROR
Jean Y. Missir, La Tronche, France, assignor to Allibert S.A., Grenoble, France
Filed Oct. 17, 1980, Ser. No. 198,253
Claims priority, application Benelux, Apr. 17, 1980, DM/000 150
Term of patent 14 years
Int. Cl. D6—*07*
U.S. Cl. D6—234

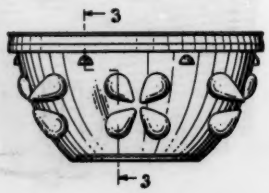


264,415
FOOD DISH
James F. Pomroy, St. Paul, Minn., assignor to Plastics, Inc., St. Paul, Minn.
Filed Oct. 13, 1977, Ser. No. 841,693
Term of patent 14 years
Int. Cl. D7—*01*
U.S. Cl. D7—1

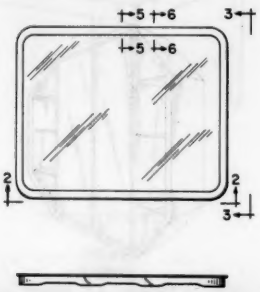
264,416
BEVERAGE MUG
John J. Urda, Jr., 4727 Wisconsin Ave., Tampa, Fla. 33616; Thomas J. Urda, 1867 Lee Rd., Cleveland Heights, Ohio 44118, and Robert A. Urda, 1730 Cliffview Rd., Cleveland, Ohio 44112
Filed Apr. 28, 1980, Ser. No. 144,213
Term of patent 14 years
Int. Cl. D07—*01*
U.S. Cl. D7—5

264,417
BEVERAGE MUG
John J. Urda, Jr., 4727 Wisconsin Ave., Tampa, Fla. 33616; Thomas J. Urda, 1867 Lee Rd., Cleveland Heights, Ohio 44118, and Robert A. Urda, 1730 Cliffview Rd., Cleveland, Ohio 44112
Filed Apr. 28, 1980, Ser. No. 144,214
Term of patent 14 years
Int. Cl. D07—*01*
U.S. Cl. D7—5

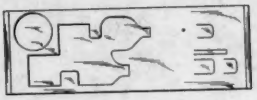
264,418
DISH
John M. Wathen, Jr., Chester, N.J., assignor to American Can Company, Greenwich, Conn.
Filed Sep. 12, 1979, Ser. No. 74,675
Term of patent 14 years
Int. Cl. D07—*01*
U.S. Cl. D7—28

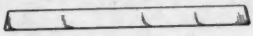


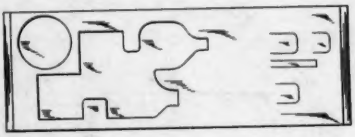
264,419
CUTTING BOARD ASSEMBLY OR THE LIKE
William H. Dorman, Corning, and Jerome J. Smith, Painted Post, both of N.Y., assignors to Corning Glass Works, Corning, N.Y.
Filed Jun. 23, 1980, Ser. No. 162,020
Term of patent 14 years
Int. Cl. D07—*04*
U.S. Cl. D7—46



264,420
STORAGE OR SERVING TRAY FOR FLATWARE AND CONDIMENTS OR THE LIKE
Kenneth Beckerman, Pittsburgh, and Michael Leusch, Glenshaw, both of Pa., assignors to Package Products, Inc., Pittsburgh, Pa.
Filed Oct. 16, 1979, Ser. No. 85,194
Term of patent 14 years
Int. Cl. D07—*99*
U.S. Cl. D7—73

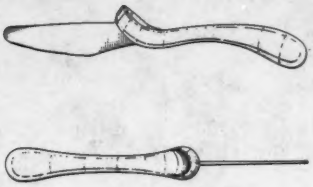




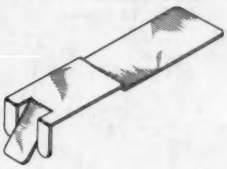


264,421
CANISTER
Pil J. Ko, Seoul, Rep. of Korea, assignor to Office of Monopoly, Republic of Korea, Seoul, Rep. of Korea
Filed Oct. 31, 1978, Ser. No. 956,995
Claims priority, application Rep. of Korea, May 12, 1978, 2317
Term of patent 14 years
Int. Cl. D7—*07*
U.S. Cl. D7—80

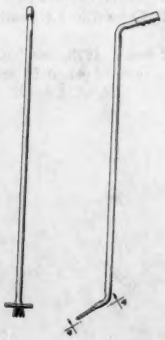
264,422
KNIFE
Peter C. Jagger, Hong Kong, Hong Kong, assignor to Little People Limited, Hong Kong, Hong Kong
Filed Feb. 1, 1980, Ser. No. 117,536
Term of patent 14 years
Int. Cl. D07—*03*
U.S. Cl. D7—150



264,423
COLLAR SUPPORTING BRACKET FOR ATTACHMENT TO A POT FOR GROWING AFRICAN VIOLETS
Florence A. Naylor, 275 N. Kalorama Dr. #501, Ventura, Calif. 93001
Filed May 16, 1980, Ser. No. 150,345
Term of patent 14 years
Int. Cl. D8—*99*
U.S. Cl. D8—1



264,424
GRASS EXTRACTING DEVICE
Hiram D. Clark, 1129 Lakeview, Mesquite, Tex. 75149
Filed Jul. 26, 1979, Ser. No. 61,038
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—13

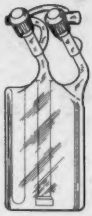


264,425
FACE PLATE FOR ELECTRICAL SWITCHES, RECEPTACLES OR THE LIKE
Carlson L. Nippel, Irvine, and Richard K. Mitts, Fullerton, both of Calif., assignors to Scovill Inc., Waterbury, Conn.
Filed Oct. 29, 1979, Ser. No. 89,570
Term of patent 14 years
Int. Cl. D8—*09*
U.S. Cl. D8—351

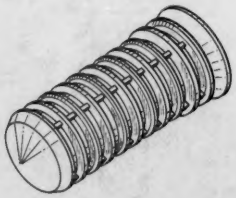
264,426
HOOK
Ruediger Einhorn, Katonah, N.Y., assignor to Coats & Clark, Inc., New Rochelle, N.Y.
Filed Apr. 25, 1980, Ser. No. 143,605
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—367

264,427
BAG FOR PACKAGING POULTRY OR THE LIKE
Donald F. Richards, Greenville, S.C., assignor to W. R. Grace & Co., Duncan, S.C.
Filed Sep. 8, 1978, Ser. No. 940,537
Term of patent 14 years
Int. Cl. D9—*05*
U.S. Cl. D9—305

264,428
BOTTLE FOR CHEMICALS
David E. Jones, Pecatonica, Ill., assignor to Apache Chemicals, Inc., Seward, Ill.
Filed May 7, 1979, Ser. No. 36,591
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—374



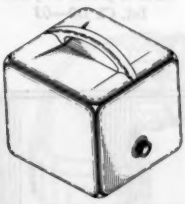
264,429
WALL ANCHOR INSERT
Anthony Foscarini; John Foscarini, and Corrado Comello, all of 17 Malley Rd., Scarborough, Ontario, Canada (M1L 2E4)
Filed Mar. 22, 1979, Ser. No. 23,017
Claims priority, application Canada, Mar. 16, 1979, 16-03-79-9
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—385



264,430
JAR OR SIMILAR ARTICLE
Floyd E. Pettengill, Lancaster, Ohio, assignor to Anchor Hocking Corporation, Lancaster, Ohio
Filed May 19, 1980, Ser. No. 151,436
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—336

264,431
CONTAINER FOR LIQUIDS UNDER PRESSURE
Kenichi Maeda, Neyagawa, Japan, assignor to The Nippon Aluminium Mfg. Co., Ltd., Osaka, Japan
Filed Apr. 21, 1980, Ser. No. 142,620
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—370

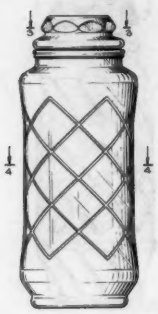
264,432
JUG OR THE LIKE
Borge Hestehave, and Kjeld Hestehave, both of 1841 E. Acacia St., Ontario, Calif. 91761
Filed Apr. 10, 1980, Ser. No. 139,094
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—374



264,433
JAR OR SIMILAR ARTICLE
Floyd E. Pettengill, Lancaster, Ohio, assignor to Anchor Hocking Corporation, Lancaster, Ohio
Filed May 12, 1980, Ser. No. 148,717
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—385

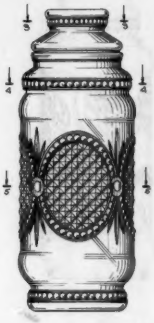
264,434
JAR OR SIMILAR ARTICLE
Floyd E. Pettengill, Lancaster, Ohio, assignor to Anchor Hocking Corporation, Lancaster, Ohio
Filed May 15, 1980, Ser. No. 150,192
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—385

264,435
JAR OR SIMILAR ARTICLE
Floyd E. Pettengill, Lancaster, Ohio, assignor to Anchor Hocking Corporation, Lancaster, Ohio
Filed May 19, 1980, Ser. No. 151,093
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—385



264,436
JAR OR SIMILAR ARTICLE
Floyd E. Pettengill, Lancaster, Ohio, assignor to Anchor Hocking Corporation, Lancaster, Ohio
Filed May 19, 1980, Ser. No. 151,527
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—385

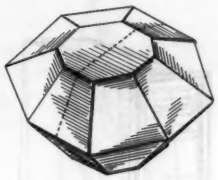
264,437
JAR OR SIMILAR ARTICLE
Floyd E. Pettengill, Lancaster, Ohio, assignor to Anchor Hocking Corporation, Lancaster, Ohio
Filed May 22, 1980, Ser. No. 152,324
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—385



264,438
COMBINED BOTTLE AND CAP
Donald V. R. Thompson, New York, N.Y., assignor to Newburgh Cosmetic Packaging Corp., Newburgh, N.Y.
Filed Jul. 9, 1979, Ser. No. 56,003
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—407

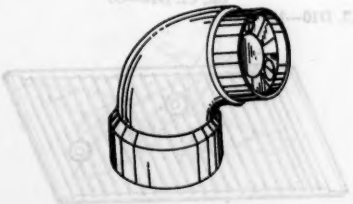
264,439
FOOD CAN OR THE LIKE
Gary K. Hasegawa, Chicago, Ill., assignor to The Continental Group, Inc., Stamford, Conn.
Filed Aug. 7, 1978, Ser. No. 931,237
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—416

264,440
CONTAINER PACKAGE
John J. Austin, LaGrange, Ill., assignor to Champion International Corporation, Stamford, Conn.
Filed Jan. 22, 1980, Ser. No. 114,194
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—431



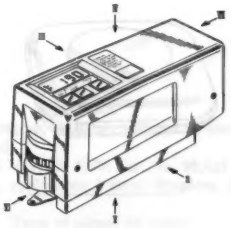
264,441
CLOSURE OR SIMILAR ARTICLE
Ernest L. Smith, Kansas City, Mo., assignor to Phillips Petroleum Company, Bartlesville, Okla.
Filed Dec. 27, 1979, Ser. No. 102,191
Term of patent 14 years
Int. Cl. D9—*07*
U.S. Cl. D9—454

264,442
CLOCK
Stephen P. Diskin, 615 S. Ridgeley Dr., Los Angeles, Calif. 90036
Filed Jul. 10, 1980, Ser. No. 167,535
Term of patent 14 years
Int. Cl. D10—*01*
U.S. Cl. D10—22



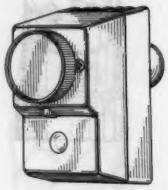
264,443
CLOCK
Stephen P. Diskin, 615 S. Ridgeley Dr., Los Angeles, Calif. 90036
Filed Jul. 10, 1980, Ser. No. 168,394
Term of patent 14 years
Int. Cl. D10—*01*
U.S. Cl. D10—22

264,444
DENSITYMETER
Ernest Muchenberger, and Walter Eichenberger, both of Zug, Switzerland, assignors to GRETAG Aktiengesellschaft, Regensdorf, Switzerland
Filed Feb. 28, 1980, Ser. No. 125,751
Claims priority, application Switzerland, Sep. 28, 1979, 110793
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—46

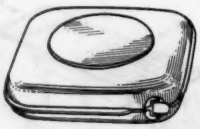


264,445
INDICATOR FOR GAME OR THE LIKE
Luther Spivey, Rte. 8, Spartanburg, S.C. 29303
Filed Aug. 17, 1979, Ser. No. 67,293
Term of patent 14 years
Int. Cl. D10—*06*
U.S. Cl. D10—46.1

264,446
TEMPORARY COLD CONTROL DEVICE
Eugene T. McKinnon, 16536 Chattanooga Pl., Pacific Palisades, Calif. 90272, and Alvin S. Drutz, 11613 Clover Ave., Los Angeles, Calif. 90066
Filed Jun. 25, 1979, Ser. No. 51,799
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—50

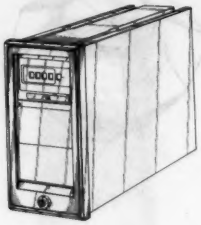


264,447
TAPE MEASURE
Walter Henkels, Holunderweg 1, 5142 Hückelhoven, Fed. Rep. of Germany
Filed Aug. 15, 1979, Ser. No. 66,677
Claims priority, application Fed. Rep. of Germany, Mar. 2, 1979, MR 123
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—72

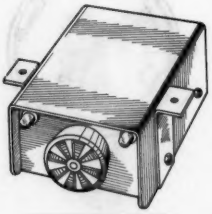


264,448
PORTABLE VOLT-OHM-AMMETER OR THE LIKE
Takeo Kuramoto, Tokyo, Japan, assignor to Kyoritsu Electrical Instruments Works, Ltd., Tokyo, Japan
Filed Feb. 29, 1980, Ser. No. 125,992
Claims priority, application Japan, Sep. 10, 1979, 54-37569
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—79

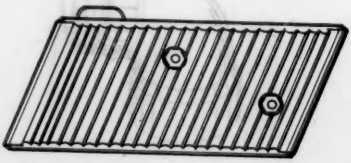
264,449
WATTMETER OR THE LIKE
Kenzou Izaki, Chiba, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Japan
Filed Apr. 29, 1980, Ser. No. 144,842
Claims priority, application Japan, Nov. 9, 1979, 54-46777
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—102



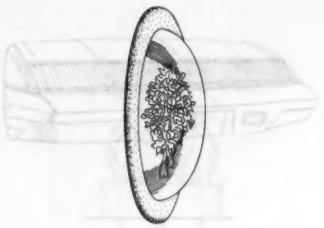
264,450
AUTOMOTIVE FUEL CONSUMPTION ALARM
Raymond P. Smith, Jr., P.O. Box 294, 129 Susquehanna St., Williamsport, Pa. 17701
Filed Mar. 26, 1979, Ser. No. 24,016
Term of patent 14 years
Int. Cl. D10—*06*
U.S. Cl. D10—106



264,451
BICYCLE ALARM
Edward A. Butler, 610 S. County Trail, North Kingston, R.I. 02852, and Francis R. Savoie, 185 Vine St., Pawtucket, R.I. 02861
Filed Jun. 11, 1979, Ser. No. 47,235
Term of patent 14 years
Int. Cl. D10—*06*
U.S. Cl. D10—106



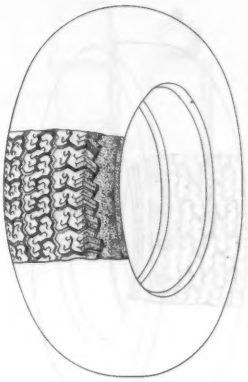
264,452
FLOWER PLAQUE
Joyce E. Crawford, 51350 Ford Rd., Canton, Mich. 48187
Filed Sep. 18, 1978, Ser. No. 944,594
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D11—139



264,453
MOBILE COMPRESSOR SERVICE UNIT FOR RAILROADS
Ross H. Francis, Charlotte, N.C., assignor to Southern Machine Products, Inc., Charlotte, N.C.
Filed Aug. 27, 1979, Ser. No. 70,338
Term of patent 14 years
Int. Cl. D12—*03*
U.S. Cl. D12—36

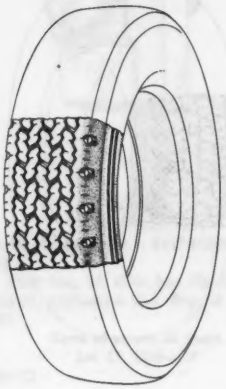
264,454
JET AIRCRAFT
Stephen L. Snyder, 5801 Magnolia Ave., Pennsauken, N.J. 08109
Filed Dec. 21, 1978, Ser. No. 971,946
Term of patent 14 years
Int. Cl. D12—*07*
U.S. Cl. D12—341

264,455
TIRE
Claude A. Hart, Sutton Coldfield, England, assignor to Dunlop Limited, London, England
Filed Aug. 28, 1979, Ser. No. 70,633
Claims priority, application United Kingdom, Mar. 10, 1979, 7988974
Term of patent 14 years
Int. Cl. D12—*15*
U.S. Cl. D12—146

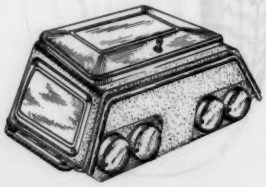


264,456
TIRE
Peter Ingley, Erdington, England, assignor to Dunlop Limited, London, England
Filed Nov. 28, 1979, Ser. No. 98,025
Claims priority, application United Kingdom, Jun. 1, 1979, 990143
Term of patent 14 years
Int. Cl. D12—*15*
U.S. Cl. D12—146

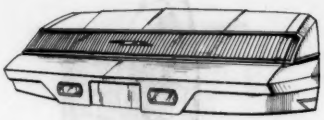
264,457
TIRE
Michael R. Corner, Coventry, England, assignor to Dunlop Limited, London, England
Filed Dec. 28, 1979, Ser. No. 107,863
Claims priority, application United Kingdom, Jul. 10, 1979, 990635
Term of patent 14 years
Int. Cl. D12—*15*
U.S. Cl. D12—147



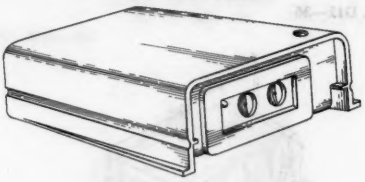
264,458
COMBINED ARTICLE CARRIER, BACK REST AND TAILLIGHT UNIT
Craig W. Vetter, and Lew Morris, both of San Luis Obispo, Calif., assignors to First Champaign Corporation, Rantoul, Ill.
Filed Dec. 26, 1978, Ser. No. 972,660
Term of patent 14 years
Int. Cl. D12—*11*
U.S. Cl. D12—158



264,459
AUTOMOBILE FRONT END
Henry D. Lauve, Troy, Mich., assignor to Electric Fuel Propulsion Corp., Troy, Mich.
Filed Oct. 23, 1979, Ser. No. 87,622
Term of patent 14 years
Int. Cl. D12—*08*
U.S. Cl. D12—196



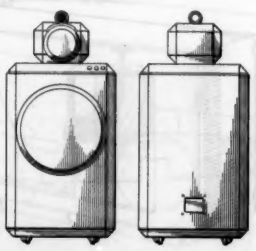
264,460
PROTECTOR TERMINAL BOX
Fred Möller, Varby, Sweden, assignor to Telefonaktiebolaget L M Ericsson, Stockholm, Sweden
Filed Apr. 9, 1979, Ser. No. 28,066
Term of patent 14 years
Int. Cl. D13—*02*
U.S. Cl. D13—11



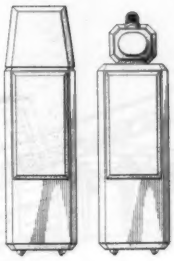
264,461
COMBINED RADIO RECEIVER AND CASSETTE TAPE RECORDER
Kuvio Hoshino, Katano, and Masanori Hamada, Yao, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan
Filed Nov. 27, 1979, Ser. No. 97,940
Claims priority, application Japan, May 31, 1979, 54-22462
Term of patent 14 years
Int. Cl. D14—*01, 03*
U.S. Cl. D14—5

264,462
PHONOGRAPH OR THE LIKE
John L. Glass, Rte. 1, Box 257, Coolidge, Ga. 31738
Filed Nov. 23, 1979, Ser. No. 96,827
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D14—19

264,463
LOUDSPEAKER
Dennis C. Ward, 10 Old Steyne, Brighton BN1 1EJ, England
Filed Jun. 6, 1979, Ser. No. 46,151
Claims priority, application United Kingdom, Dec. 21, 1978, 987793; Apr. 19, 1979, 989540
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D14—34



264,464
LOUDSPEAKER
Dennis C. Ward, 10 Old Steyne, Brighton BN1 1EJ, England
Filed Sep. 16, 1980, Ser. No. 187,731
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D14—34



264,465
EXPANSIBLE COMPACT TELEPHONE
William G. MacKenzie, Middletown, N.J., assignor to International Telephone and Telegraph Corporation, New York, N.Y.
Filed Aug. 29, 1979, Ser. No. 70,933
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—53

264,466

DOCUMENT PROCESSING WORK STATION

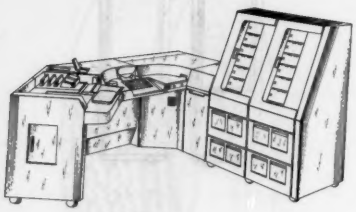
Arnold M. Davis, Saugerties, and David L. Schaum, Woodstock, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 15, 1979, Ser. No. 84,979

Term of patent 14 years

Int. Cl. D14—*02*

U.S. Cl. D14—104



264,467

INTERACTIVE TERMINAL

Wolfgang Fischer, Boeblingen, Fed. Rep. of Germany, assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Sep. 21, 1979, Ser. No. 77,890

Claims priority, application Fed. Rep. of Germany, Mar. 22, 1979, 4987

Term of patent 14 years

Int. Cl. D14—*02*

U.S. Cl. D14—105

264,468

COMPUTER HOUSING

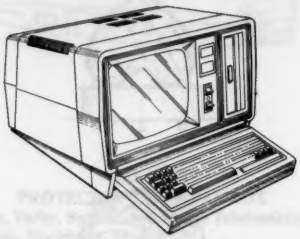
Bernard A. Grae, Fort Worth, Tex., assignor to Tandy Corporation, Fort Worth, Tex.

Filed Nov. 1, 1979, Ser. No. 90,451

Term of patent 14 years

Int. Cl. D14—*02*

U.S. Cl. D14—106



264,469

DUAL DATA STATION FOR DISTRIBUTED DATA SYSTEM

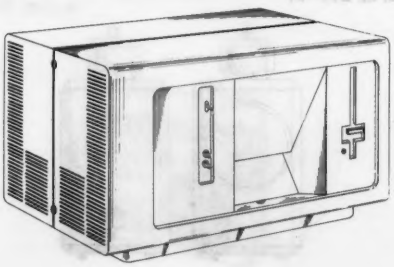
Collan B. Kneale, Rochester, Minn., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 12, 1979, Ser. No. 102,604

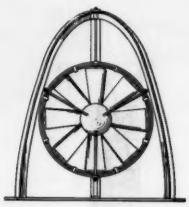
Term of patent 14 years

Int. Cl. D14—*02*

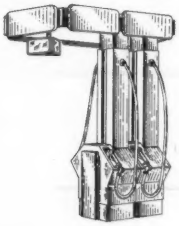
U.S. Cl. D14—107



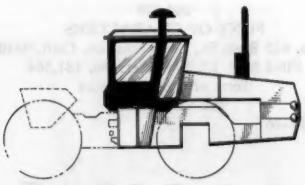
264,470
WINDMILL GENERATOR
David D. Delbert, 15240 Grasshopper Rd., Huntingdon Valley, Pa. 19006
Filed Dec. 6, 1979, Ser. No. 100,993
Term of patent 14 years
Int. Cl. D15—*01*
U.S. Cl. D15—1



264,471
DUAL GASOLINE PUMP
David C. Rowan, 6713 Kanata Crt., Fort Wayne, Ind. 46815, and Armin E. Mittermaier, 3401 Kirkwood Dr., Fort Wayne, Ind. 46805
Filed Nov. 9, 1978, Ser. No. 959,438
Term of patent 14 years
Int. Cl. D15—*02*
U.S. Cl. D15—9.2

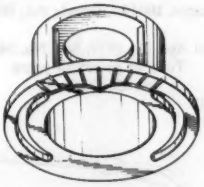


264,472
COMBINED TRACTOR CAB AND HOOD
Richard B. Carlson, Fargo, N. Dak., and Gary O. Bowhall, Ada, Minn., assignors to Steiger Tractor, Inc., Fargo, N. Dak.
Filed Jul. 20, 1979, Ser. No. 59,260
Term of patent 14 years
Int. Cl. D15—*03*
U.S. Cl. D15—23

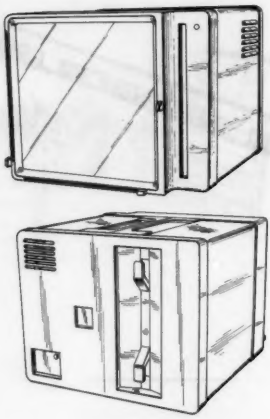


264,473
COMBINED WARP THREAD CARRIER, THREAD AND ADHESIVE HOLDING STRIP THEREFOR
Christer Ekelund, Björkelycka, S-510 10 Horred, Sweden
Filed Jan. 19, 1979, Ser. No. 5,183
Claims priority, application Fed. Rep. of Germany, Jul. 25, 1978, 7822192[U]
Term of patent 14 years
Int. Cl. D15—*06*
U.S. Cl. D15—78

264,474
DIRECTIONAL INLET CONTROL CAGE FOR ABRASIVE SHOT
William G. G. Tutton, Belper, England, assignor to Auto Alloys R&D Limited, Derbyshire, England
Filed Oct. 23, 1979, Ser. No. 87,572
Claims priority, application United Kingdom, Apr. 24, 1979, 989627
Term of patent 14 years
Int. Cl. D15—*09*
U.S. Cl. D15—126



264,475
MICROFILM-READER
Ulrich Grote, Bad Nauheim, Fed. Rep. of Germany, assignor to MAP Mikrofilm Apparatebau Dr. Poehler GmbH & Co. KG, Ober-Moerlen, Fed. Rep. of Germany
Filed Sep. 17, 1979, Ser. No. 75,981
Term of patent 14 years
Int. Cl. D16—*02*
U.S. Cl. D16—14



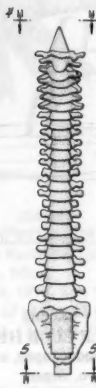
264,476
EYE-GLASS TEMPLE
Norman H. Stensager, 10449 Colorado Rd., Bloomington, Minn. 55438
Filed Apr. 30, 1979, Ser. No. 34,675
Term of patent 14 years
Int. Cl. D16—*06*
U.S. Cl. D16—127

264,477
GUITAR FRETBOARD OR THE LIKE
Rachael E. Brent, P.O. Box 1684, San Bruno, Calif. 94066
Filed Jun. 18, 1979, Ser. No. 49,199
Term of patent 14 years
Int. Cl. D17—*03*
U.S. Cl. D17—20

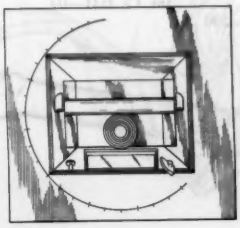
264,478
FONT OF CHARACTERS
John Casado, 425 Bush St., San Francisco, Calif. 94108
Filed Mar. 17, 1980, Ser. No. 131,164
Term of patent 14 years
Int. Cl. D18—*03*
U.S. Cl. D18—26

BGOQ2345

264,479
PEN
John W. Williams, 8551 Wahrman, Romulus, Mich. 48174
Filed Jun. 18, 1979, Ser. No. 49,355
Term of patent 14 years
Int. Cl. D19—*06*
U.S. Cl. D19—42

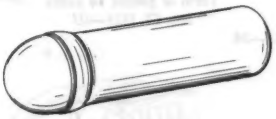


264,480
SOLAR ENERGY DEMONSTRATOR
Gaylord B. Buck, Denver, Colo., assignor to Aero Systems Research, Inc., Denver, Colo.
Filed Jul. 14, 1980, Ser. No. 167,841
Term of patent 14 years
Int. Cl. D19—*07*
U.S. Cl. D19—64



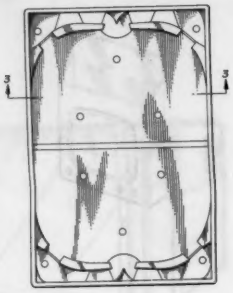
264,481
PERIODICAL HOLDER
Thomas J. Russo, 2228 Bergen Ave., Brooklyn, N.Y. 11234
Filed Jul. 18, 1979, Ser. No. 58,604
Term of patent 14 years
Int. Cl. D19—*02*
U.S. Cl. D19—75

264,482
POP TOY
Lavern M. Pfeifer, 1321 Commerce, Dallas, Tex. 75221
Filed Apr. 6, 1979, Ser. No. 27,753
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—2



264,483
TARGET FOR TOSS GAME
Armand Raymond, 1466 Sicard St., Apt. 4, Montreal, Quebec, Canada (H1V 2X4)
Filed Oct. 5, 1979, Ser. No. 82,033
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—4

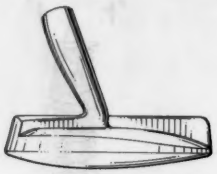
264,484
GAME BOARD
Frank Hengle, 79 Hurlbert Ave., Akron, Ohio 44303
Filed Nov. 20, 1979, Ser. No. 96,210
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—27



264,485
CASING FOR AMUSEMENT APPARATUS
Leonard J. Kitchen, Brodhead, Wis., assignor to Marcon Industries, Inc., Des Moines, Iowa
Filed Aug. 8, 1980, Ser. No. 176,401
Term of patent 14 years
Int. Cl. D21—*03*
U.S. Cl. D21—38

264,486
KITE
James Lazzaro, 3500 Sutton Rd.; Guy N. Lazzaro; Guy M. Lazzaro, both of 104 Newton Rd., and Nicholas Lazzaro, 3400 Sutton Rd., all of West Hollywood, Fla. 33023
Filed Jul. 19, 1979, Ser. No. 58,954
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—88

264,487
GOLF PUTTER HEAD
Samuel J. Barr, 500 N. Washington Ave., Titusville, Fla. 32780, and Alfred O. Stuff, 1603 Camberburt St., Orlando, Fla. 32805
Filed Mar. 3, 1980, Ser. No. 126,460
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D21—217

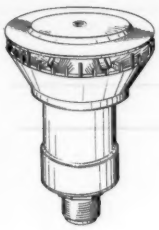


264,488
GOLF CLUB HEAD
Masashi Kobayashi, Matsudo, Japan, assignor to Maruman Golf Kabushiki Kaisha, Tokyo, Japan
Filed Apr. 8, 1980, Ser. No. 138,521
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D21—220

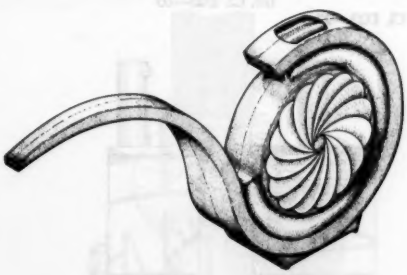
264,489
WATER SKI TOW HANDLE
Dennis Holland, 3599 Orchard Lake Rd., Orchard Lake, Mich. 48033
Filed Feb. 7, 1980, Ser. No. 119,305
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D21—230

264,490
FLY
Norman A. Anderson, 15151 SE. Royer Rd., Clackamas, Oreg. 97015
Filed Apr. 7, 1980, Ser. No. 137,733
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—27

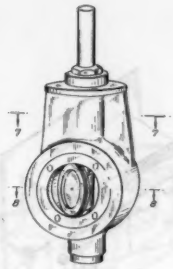
264,491
SPRINKLER
Edwin J. Hunter, Rancho Santa Fe, Calif., assignor to The Toro Company, Minneapolis, Minn.
Filed Oct. 9, 1979, Ser. No. 82,550
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—7



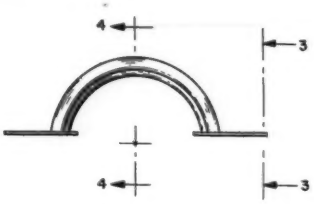
264,492
WATERING CAN
Robert J. Welch, West Chicago, Ill., assignor to Phillips Petroleum Company, Bartlesville, Okla.
Filed Oct. 26, 1979, Ser. No. 88,715
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—11



264,493
BUTTERFLY VALVE
Gustav B. Nyberg, Säffle, Sweden, assignor to Eur-Control Kalle AB, Sweden
Continuation-in-part of Ser. No. 83,965, Oct. 11, 1979. This application May 19, 1980, Ser. No. 150,639
Claims priority, application Sweden, Mar. 27, 1979, 79-0779
Term of patent 7 years
Int. Cl. D23—*01*
U.S. Cl. D23—19

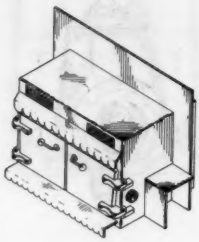


264,494
PIPELINE PROTECTOR
Amadeo Chapa, 4 Talisman Ct., Houston, Tex. 77076
Filed Feb. 25, 1980, Ser. No. 124,159
Term of patent 14 years
Int. Cl. D23—*99*
U.S. Cl. D23—40

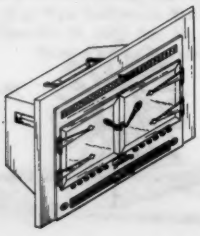


264,495
CARBURETOR AIR INTAKE HEATER
Frank Curtis, Hewlett, N.Y., assignor to Curtis Motor Modifications, Inc., Freeport, N.Y.
Filed Feb. 12, 1980, Ser. No. 120,902
Term of patent 14 years
Int. Cl. D23—*99*
U.S. Cl. D23—77

264,496
STOVE
Ronald J. Larsen, Providence, Utah, assignor to Fireking Stoves of Utah, Inc., Logan, Utah
Filed Feb. 14, 1980, Ser. No. 121,573
Term of patent 14 years
Int. Cl. D23—03
U.S. Cl. D23—93

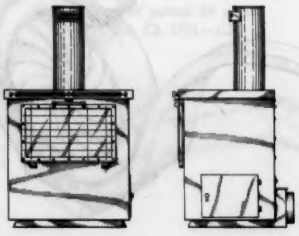


264,497
FIREPLACE INSERT
James A. Morande, Jr., 14 Wesleyan Rd., Glastonbury, Conn. 06033
Filed Apr. 4, 1980, Ser. No. 137,319
Term of patent 14 years
Int. Cl. D23—03
U.S. Cl. D23—94



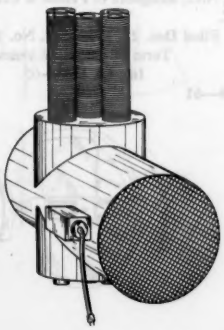
264,498
STOVE
James A. Morande, Jr., 114 Wesleyan Rd., Glastonbury, Conn. 06033
Continuation-in-part of Ser. No. 25,737, Mar. 30, 1979, abandoned. This application May 5, 1980, Ser. No. 146,523
Term of patent 14 years
Int. Cl. D23—03
U.S. Cl. D23—97

264,499
WOOD BURNING STOVE
James E. Lundy, Box 351, Mackay, Id. 83251
Filed May 27, 1980, Ser. No. 153,621
Term of patent 14 years
Int. Cl. D23—03
U.S. Cl. D23—97

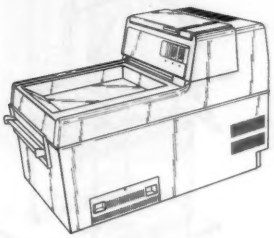


264,500
HEAT RETRIEVAL UNIT
Darrow R. Beaton, 5519 Penn Ave. South, Minneapolis, Minn. 55410
Filed Oct. 22, 1979, Ser. No. 87,552
Term of patent 14 years
Int. Cl. D23—*03*
U.S. Cl. D23—136

264,501
HEAT RETRIEVAL UNIT FOR INSTALLATION INTO A FLUE DUCT
Darrow R. Beaton, 5519 Penn Ave. South, Minneapolis, Minn. 55410
Filed Oct. 22, 1979, Ser. No. 87,553
Term of patent 14 years
Int. Cl. D23—*03*
U.S. Cl. D23—136

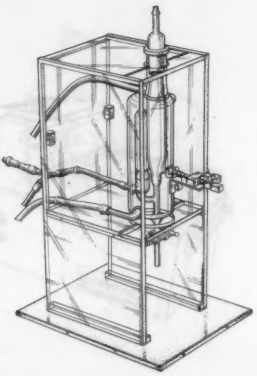


264,502
APPARATUS FOR DEVELOPING X-RAYS FILMS
Mathias Müller, Oberstenfeld, and Gerhard Schmidtchen, Sachsenheim, both of Fed. Rep. of Germany, assignors to Durr Dental GmbH and Co., KG, Fed. Rep. of Germany
Filed Mar. 31, 1980, Ser. No. 135,456
Claims priority, application Fed. Rep. of Germany, Oct. 3, 1979, 1410
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D24—2

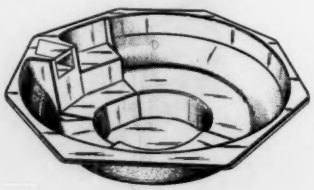


264,503
ACTUATOR FOR MAINTAINING THE POSITION OF A CONTAINER COVER
Roger S. Sanderson, 24772 Santa Clara, Dana Point, Calif. 92629, and Robert C. Whelchel, Newport Beach, Calif., assignors to Roger S. Sanderson, Dana Point, Calif.
Filed Jan. 28, 1980, Ser. No. 115,675
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D24—9

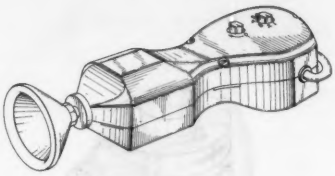
264,504
GAS TONOMETER
Russell S. Weber, 1522 Aspenwall Rd., Westlake Village, Calif. 91361, and Thomas H. Miller, 798 Malat Dr., Newbury Park, Calif. 91320
Filed Oct. 15, 1979, Ser. No. 84,808
Term of patent 14 years
Int. Cl. D24—*99*
U.S. Cl. D24—21



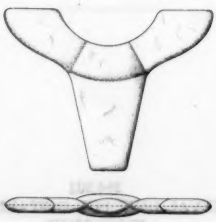
264,505
HYDROTHERAPY SPA
Richard G. Reineman, Newport Beach, Calif., assignor to Marlin Fiberglass, Huntington Beach, Calif.
Continuation-in-part of Ser. No. 47,274, Jun. 11, 1979, Pat. No. Des. 254,447, which is a continuation-in-part of Ser. No. 5,911, Jan. 23, 1979, abandoned. This application Mar. 10, 1980, Ser. No. 128,637
Term of patent 14 years
Int. Cl. D24—*01;* D23—*02;* D25—*99*
U.S. Cl. D24—38



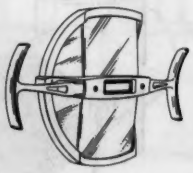
264,506
PERCUSSOR APPARATUS
Robert C. McShirley, Glendale, Calif., assignor to McShirley Products, Inc., Glendale, Calif.
Filed Feb. 6, 1981, Ser. No. 232,249
Term of patent 14 years
Int. Cl. D24—*02;* D28—*03*
U.S. Cl. D24—41



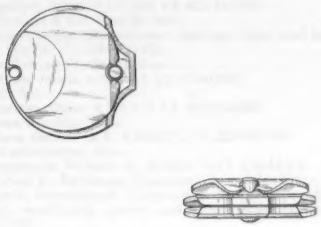
264,507
POSTURE PILLOW
Evangeline M. Haase, 765 Santa Camelia Dr., Solana Beach, Calif. 92075
Filed Apr. 18, 1980, Ser. No. 141,340
Term of patent 14 years
Int. Cl. D24—*04;* D6—*09*
U.S. Cl. D24—64



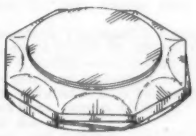
264,508
DENTAL LIGHT
James A. Williams, Van Wyck, S.C., and William C. Hardin, Jr., Charlotte, N.C., assignors to Pelton & Crane Company, Charlotte, N.C.
Filed Dec. 21, 1979, Ser. No. 106,156
Term of patent 14 years
Int. Cl. D26—*05*
U.S. Cl. D26—61



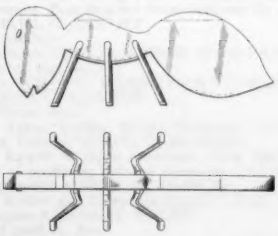
264,509
FINGERNAIL CLIPPER OR THE LIKE
Bernard M. Rock, 1833 S. Leyden St., Denver, Colo. 80222
Filed Mar. 11, 1980, Ser. No. 129,354
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D28—60



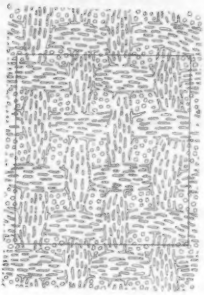
264,510
LIGHTED COMPACT
Raymond Boyd, 2235 Cambridge Rd., Broomall, Pa. 19008
Filed Aug. 15, 1979, Ser. No. 66,809
Term of patent 14 years
Int. Cl. D3—*01*
U.S. Cl. D28—78



264,511
ANTFARM
Joseph W. Berteloot, 310 Ladera, San Jose, Calif. 95134
Filed May 30, 1980, Ser. No. 154,822
Term of patent 14 years
Int. Cl. D30—*02*
U.S. Cl. D30—1

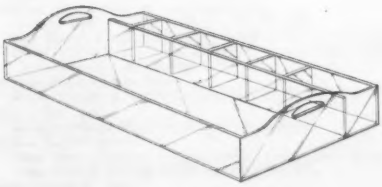


264,512
EMBOSSED CONTINUOUS SHEET TISSUE-LIKE MATERIAL OR SIMILAR ARTICLE
Sedgwick C. Rogers, Appleton, Wis., assignor to Kimberly-Clark Corporation, Neenah, Wis.
Filed Jan. 14, 1980, Ser. No. 111,761
Term of patent 14 years
Int. Cl. D5—*06*
U.S. Cl. D59—2 B



264,513
BAKERY TRAY
Daniel R. Miller, Cincinnati, Ohio, assignor to Nestier Corporation, Cincinnati, Ohio and Ekco Products, Inc., Wheeling, Ill.
Filed Feb. 8, 1980, Ser. No. 119,814
Term of patent 14 years
Int. Cl. D99—*00*
U.S. Cl. D34—43

264,514
CHANGING TRAY FOR INFANTS
Howard Kordan, 742 S. Cloverdale Ave., Los Angeles, Calif. 90036
Filed Jan. 25, 1979, Ser. No. 6,470
Term of patent 14 years
Int. Cl. D07—*99*
U.S. Cl. D34—45



LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 18TH DAY OF MAY, 1982

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A. Ahlstrom Osakeyhtio: *See*—
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A. Nattermann & Cie. GmbH: *See*—
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AB CTC: *See*—
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AB Tranas Rostfria: *See*—
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Abbott, Ned E.; Keshavan, Hampapur R.; and McGuire, Robert J., to Rockwell International Corporation. Protected muldem with improved monitoring system and error detection. 4,330,885, Cl. 370-17.000.

Aboussouan, Michel F. Tape cartridge storage device. 4,330,162, Cl. 312-15.000.

Abraham, Fayez F.; and Perez, Arthur, to Tyler Refrigeration Corporation. Open top multiband refrigerated display case. 4,329,852, Cl. 62-256.000.

Abrahams, Siegfried: *See*—
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Abramatic, Jean-Francois: *See*—
Pratt, William K.; Abramatic, Jean-Francois; and Faugeras, Olivier, 4,330,833, Cl. 364-515.000.

Abts, Manfred; and Urban, Dieter, to Ford Motor Company. Cylinder head for an internal-combustion engine. 4,329,949, Cl. 123-90.340.

Acker, Rolf-Dieter; Buschmann, Ernst; Thym, Sabine; Zeeh, Bernd; and Pommer, Ernst-Heinrich, to BASF Aktiengesellschaft. Fungicidal azolyl-silyl-glycol ethers, their use for combating fungi, and agents therefor. 4,330,535, Cl. 424-184.000.

Adams, Don L.: *See*—
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Adcock, James L.; and Renk, Ehrengard B. Aerosol direct fluorination method and apparatus. 4,330,475, Cl. 549-380.000.

Agdanowski, Ronald T., to Sherwood Medical Industries Inc. Method of making grooved plastic medical tubing. 4,330,497, Cl. 264-150.000.

Agence Nationale de Valorisation de la Recherche: *See*—
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Stemme, Otto; Wagensonner, Eduard; and Ruf, Wolfgang, 4,330,793, Cl. 358-56.000.

Aguero, Lazaro. Automatic weight operated toilet flushing device. 4,329,745, Cl. 4-313.000.

Ahiko, Nobuo: *See*—
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Ahner, Stefan; Christ, Richard; Klein, Dieter; and Srostlik, Peter. Container combination for the transportation and storage of radioactive waste especially nuclear reactor fuel elements. 4,330,711, Cl. 250-506.000.

Aikens, Paul W.; and Wilding, Frank J., to Du Pont de Nemours, E. I., and Company. Zero insertion force connector for LSI circuit package. 4,330,163, Cl. 339-17.0CF.

Aimpoint AB: *See*—
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Air Resources, Inc.: *See*—
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Akiyama, Keiichi, to Japan Aluminium Alloy Refiners Association. Method of producing low-line aluminous cement from aluminum smelting residue. 4,330,336, Cl. 106-104.000.

Akiyama, Kenzo; and Tomiyama, Ryoji, to Tomy Kogyo Co., Inc. Fluid engine. 4,329,806, Cl. 46-44.000.

Akopian, Leonid A.: *See*—
Kostandov, Leonid A.; Enikolopov, Nikolai S.; Dyachkovsky, Fridrikh S.; Novokshonova, Ljudmila A.; Gavrilov, Jury A.; Kudinova, Olga I.; Maklakova, Tatyana A.; Akopian, Leonid A.; Mchedlov-Petrosian, Otar P.; Boilko, Mikhail I.; Staroselsky, Alexandr A.; and Tkachenko, Vladimir P., 4,330,573, Cl. 427-213.000.

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Zeelen, Filippus J., 4,330,540, Cl. 424-238.000.

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Albright, Donald R.; Sage, Henry F.; and Archibald, James B., to General Electric Company. Air-gap winding stator construction for dynamoelectric machine. 4,330,726, Cl. 310-254.000.

Aldridge, Clyde L.: *See*—
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Alexander, Harold; Parsons, John R.; Strauchler, Irving D.; and Weiss, Andrew B., to College of Medicine and Dentistry of New Jersey. Bio-absorbable composite tissue scaffold. 4,329,743, Cl. 3-1.000.

Alexander, Robert E.; and Baugh, Kenneth R., to Monsanto Company. Process for softening nonwoven fabrics. 4,329,763, Cl. 28-104.000.

Alford, John A., to Westvaco Corporation. Flotation of phosphate ores with anionic agents. 4,330,398, Cl. 209-166.000.

Alissandratos, Tacko D. Brush. 4,329,755, Cl. 15-144.00B.

Allaire, Roger A.; Pardue, William F., Jr.; and VanDewoestine, Robert V., to Corning Glass Works. Wood burning stove. 4,330,503, Cl. 422-177.000.

Allegheny Ludlum Steel Corporation: *See*—
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Smith, Richard L.; and Allen, Kent V., 4,330,828, Cl. 364-431.000.

Allen, Roy A., to Shell Oil Company. Curable tris(hydroxyalkyl) aminomethane-modified epoxy resin composition. 4,330,644, Cl. 525-523.000.

Allied Corporation: *See*—
Narasimhan, Mandayam, 4,330,027, Cl. 164-461.000.
Yardley, James T.; Rosan, Alan M.; and Menger-Hammond, Eva L., 4,330,382, Cl. 204-157.10R.

Alliger, Howard. Germ-killing materials. 4,330,531, Cl. 424-149.000.

Alm, Oddvar; Andersen, Bjarne; and Samuelsen, Eirik, to Dyno Industrier A.S. Cap-sensitive powdered explosive composition. 4,330,346, Cl. 149-21.000.

Alphonse, Gerard A.: *See*—
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Alvarez, Joseph A., III; Bensadon, Joseph M.; Brennen, John F.; and Krug, Robert W., to International Business Machines Corporation. Dynamically variable priority, variable position channels in a TDMA burst. 4,330,857, Cl. 370-104.000.

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Anagnostopoulos, Constantine N.; Lee, Teh-Hsuang; Burkey, Bruce C.; and Lavine, James P., to Eastman Kodak Company. Block readable charge coupled device. 4,330,796, Cl. 358-213.000.

Andersen, Ariel A. Time-energy conserving low cost home pressure cooking system. 4,329,919, Cl. 99-359.000.

Andersen, Bjarne: *See*—
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Anderson, Paul M., to General Atomic Company. Thermally actuated linkage arrangement. 4,330,369, Cl. 376-268.000.

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Anderson, Raymond P.; Schmalzer, David K.; and Wright, Charles H., to Pittsburg & Midway Coal Mining Co., The. Short residence time coal liquefaction process including catalytic hydrogenation. 4,330,388, Cl. 208-8.0LE.

Anderson, Roland M., to Modcom, Inc. Orthodontic-dispenser and tool combined with dispensed articles. 4,330,271, Cl. 433-3.000.

Anderson, Thomas W., to Bell Telephone Laboratories, Incorporated. Apparatus for generating synchronized timing pulses from binary data signals. 4,330,759, Cl. 331-14.000.

Andoh, Makoto: *See*—
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Annen, Klaus; Laurent, Henry; Hofmeister, Helmut; Petzoldt, Karl; and Wiechert, Rudolf, to Schering Aktiengesellschaft. Novel corticoid 17-thioacetals, their preparation and use. 4,330,541, Cl. 424-243.000.

Anthracite, Nancy E., to Board of Regents, The University of Texas System. Catheter for nasotracheal aspiration of uncontaminated sputum specimens. 4,329,995, Cl. 128-350.00R.

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Arends, Thomas C., to Datapoint Corporation. Optical data link. 4,330,870, Cl. 455-617.000.

Arima, Teruo; Machii, Kenji; Chikazawa, Nobumoto; Takeuchi, Tetsuya; and Fujii, Setsuro. Wound treatment agent. 4,330,527, Cl. 424-94.000.

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Sakurai, Hisaya; Katayama, Yoshihiko; Ikegami, Tadashi; and Furusato, Masayasu, 4,330,651, Cl. 526-127.000.
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Avar, Zoltan; and Salavetz, Lajos, to Epitogepgyarto Vallalat. Process and system for controlling the energization of a load. 4,330,817, Cl. 363-96.000.

Axlander, Axel N. A. Heat exchanger wall element comprising natural fiber material drenched first with a salt solution and thereafter with a water glass binder. 4,330,577, Cl. 428-36.000.

Ayers, John S.; Bethell, Geoffrey S.; Hancock, William S.; and Hearn, Milton T. W., to Development Finance Corporation of New Zealand. Activated matrix and method of activation. 4,330,440, Cl. 525-54.310.

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Bales, Stephen E., to Dow Chemical Company, The. Ordered copolyestercarbonate resins. 4,330,662, Cl. 528-176.000.

Balint, Nikolaous K., to Standard Oil Company (Indiana). Catalyst system. 4,330,431, Cl. 252-429.00B.

Ball Corporation: *See*—
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Barker, Michael D., to Shell Oil Company. Herbicidal tetrahydrofuran derivatives. 4,330,320, Cl. 71-94.000.

Barnes, Robert W. Electrically illuminated wrist watch dial. 4,330,877, Cl. 368-67.000.

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Battah, Husam, to Michigan Consolidated Gas Company. Compressor and engine efficiency system and method. 4,330,237, Cl. 417-2.000.

Battelle Memorial Institute: *See—*
Schachner, Herbert; Ekemar, Carl S. G.; and Haglund, Bengt O., 4,330,332, Cl. 75-203.000.

Bauer, Edwald, to Wurttembergische Metallwarenfabrik. Steam pressure cooker. 4,330,069, Cl. 220-203.000.

Baugh, Daniel W., Jr.: *See—*
Timberlake, John F.; Baugh, Daniel W., Jr.; and Burkes, Bobby, 4,330,481, Cl. 260-463.000.

Baugh, Kenneth R.: *See—*
Alexander, Robert E.; and Baugh, Kenneth R., 4,329,763, Cl. 28-104.000.

Bayer Aktiengesellschaft: *See—*
Grogler, Gerhard; and Kallert, Wilhelm, 4,330,656, Cl. 528-52.000.
Heins, Ferdinand; Tork, Leo; and Hohne, Wolfgang, 4,330,597, Cl. 428-473.000.
Hermann, Karl H., 4,330,476, Cl. 260-393.000.
Hoffmann, Hellmut, 4,330,482, Cl. 260-465.00G.
Kraatz, Udo; Buchel, Karl H.; Stetter, Jorg; Frohberger, Paul-Ernst; and Brandes, Wilhelm, 4,330,547, Cl. 424-263.000.
Krimm, Heinrich; Buysch, Hans-Josef; and Rudolph, Hans, 4,330,665, Cl. 528-200.000.
Linke, Siegfried; Mardin, Mithat; Krause, Hans P.; and Sitt, Rudiger, 4,330,677, Cl. 562-583.000.
Marhold, Albrecht; and Klauke, Erich, 4,330,366, Cl. 260-544.00F.
Schaupp, Kurt; Reitz, Gunther; and Boehmke, Gunther, 4,330,334, Cl. 106-90.000.
Wolfers, Heinrich; Mayer, Wolfram; Rudolph, Hans; and Mietzsch, Fritz, 4,330,638, Cl. 525-12.000.

Bayer, Horst O.; Swithenbank, Colin; and Yih, Roy Y., to Rohm and Haas Company. Herbicidal 4-trifluoromethyl 4-nitrodiphenyl ethers. 4,330,324, Cl. 71-105.000.

BCM Manufacturing Ltd.: *See—*
Christie, Thomas D.; Ballantine, Robert K.; and Moreau, Pierre A., 4,329,939, Cl. 119-28.000.

Beach, David L.; Lunden, Richard W.; and Zambelli, Adolfo, to Gulf Research & Development Company. Catalyst composition. 4,330,432, Cl. 252-429.00C.

Bearden, Roby, Jr.; Aldridge, Clyde L.; and Baird, William C., Jr., to Exxon Research & Engineering Co. Hydroconversion process. 4,330,392, Cl. 208-10.000.

Becker Dental-Labor GmbH: *See—*
Becker, Gunter; and Weiden, Horst, 4,330,276, Cl. 433-69.000.

Becker, Gunter; and Weiden, Horst, to Becker Dental-Labor GmbH. Process and apparatuses for reproducing jaw movements. 4,330,276, Cl. 433-69.000.

Becker, Udo; Busch, Wolfram; Fischer, Johann P.; and Sommer, Werner, to Hoechst Aktiengesellschaft. Medical apparatus for parenteral liquids. 4,329,992, Cl. 128-272.000.

Beckerman, Howard L.; and Sedlatschek, Robert, to Singer Company, The. Universal expansion module. 4,329,933, Cl. 112-158.00E.

Beckman Instruments, Inc.: *See—*
Jain, Chandra P.; and Shu, Frank R., 4,330,296, Cl. 23-230.00B.

Becton Dickinson & Co.: *See—*
Desai, Jay S., 4,330,622, Cl. 435-34.000.
Johnson, Luther R., 4,330,216, Cl. 366-222.000.

Beech, Harvey E.; and Bird, Richard M. Apparatus for metering fuel additives to internal combustion engines. 4,329,945, Cl. 123-25.00B.

Beehler, Mockabee, Arant & Jagger: *See—*
Love, David A., 4,329,902, Cl. 84-1.250.

Behn, Rudolf: *See—*
Bohmer, Branislaw; Hoppe, Lutz; Szablikowski, Klaus; Kudora, Dieter; and Behn, Rudolf, 4,330,441, Cl. 525-54.230.

Beldam Packing & Rubber Company Limited, The: *See—*
Henson, Robert W. J., 4,330,136, Cl. 277-228.000.

Bell, Michael. Boot with angularly extending cleats. 4,329,790, Cl. 36-32.00R.

Bell Telephone Laboratories, Incorporated: *See—*
Anderson, Thomas W., 4,330,759, Cl. 331-14.000.
Embree, Milton L.; and Martin, Earl O., 4,330,744, Cl. 323-316.000.
Kubiak, Glenn D.; and Panish, Morton B., 4,330,360, Cl. 156-610.000.
Miedema, Hotze, 4,330,764, Cl. 333-18.000.
Parker, Frederick D., 4,330,683, Cl. 174-52.0FP.
Sampson, George P., III, 4,330,722, Cl. 307-443.000.
Smolik, Kenneth F., 4,330,862, Cl. 375-75.000.

Beloit Corporation: *See—*
Cronin, Dennis C., 4,330,023, Cl. 162-358.000.
Wong, George H., 4,329,893, Cl. 83-24.000.

Bendix Corporation, The: *See—*
Cybulski, Mark J.; Gumkowski, Bert A.; and Portolese, Larry A., 4,330,049, Cl. 188-73.360.
Eslinger, Ralph G., 4,330,240, Cl. 418-1.000.
Gaiser, Robert F., 4,329,846, Cl. 60-562.000.
Sebo, Milan J., 4,330,157, Cl. 303-7.000.
Whiteside, Arliss E.; and Freedman, Morris D., 4,330,826, Cl. 364-200.000.
Wilensky, Barry F.; and Maggi, Joseph A., 4,330,779, Cl. 340-705.000.

Bennett, Maurice R., to Thorn EMI Limited. Electrostatic printing apparatus including an electron beam tube. 4,330,789, Cl. 346-161.000.

Bennett, Thomas H.: *See—*
Daniels, R. Gary; Bennett, Thomas H.; and Wiles, Michael F., 4,330,842, Cl. 364-900.000.

Bensadon, Joseph M.: *See—*
Alvarez, Joseph A., III; Bensadon, Joseph M.; Brennen, John F.; and Krug, Robert W., 4,330,857, Cl. 370-104.000.

Bergersen, Earl O. Means for attaching a headgear to a positioner. 4,330,272, Cl. 433-5.000.

Bergerud, Wilson L. Folding bed-frame member and bed assembly. 4,329,746, Cl. 5-164.00R.

Beriger, Ernst: *See—*
Pissiotas, Georg; and Beriger, Ernst, 4,330,536, Cl. 424-200.000.

Berliner, Robert. Receptacle with collapsible internal container. 4,330,066, Cl. 215-1.00C.

Bernauer, Otto: *See—*
Buchner, Helmut; and Bernauer, Otto, 4,330,084, Cl. 237-12.100.

Berner, John M., to Garven, David H., a part interest. Snow remover. 4,329,792, Cl. 37-43.00D.

Berning, Wilfried; and Siegel, Hardo, to BASF Aktiengesellschaft. Diastereomeric salts of malic acid and 2-aminobutanol, and process for the resolution of rademis maic acid. 4,330,484, Cl. 260-501.170.

Bertolacini, Ralph J.; Kim, Dae K.; and Lehmann, Gerald M., to Standard Oil Company (Indiana). Catalyst for the disproportionation of petroleum hydrocarbons. 4,330,435, Cl. 252-455.00Z.

Bessho, Sadao: *See—*
Nemoto, Kaoru; Ogasawara, Toshichika; and Bessho, Sadao, 4,330,561, Cl. 426-140.000.

Bethell, Geoffrey S.: *See—*
Ayers, John S.; Bethell, Geoffrey S.; Hancock, William S.; and Hearn, Milton T. W., 4,330,440, Cl. 525-54.310.

Betzing, Hans: *See—*
Lautenschlager, Hans-Heiner; Betzing, Hans; and Stoll, Brigitte, 4,330,550, Cl. 424-273.00R.

Beu, Richard A., to Teledyne Hanau. Dental face bow. 4,330,277, Cl. 433-73.000.

Bexton, Stewart G.; Hildred, Gordon C.; Higgins, John T.; and Whitham, James G., to Cominco Ltd. Manufacture of urea sulfur fertilizer. 4,330,319, Cl. 71-28.000.

Bey, Philippe; and Jung, Michel, to Merrell-Toraude et Cie. Method of treating benign prostatic hypertrophy. 4,330,559, Cl. 424-319.000.

Beyer, Karl-Heinz: *See—*
Hertel, Otto; Beyer, Karl-Heinz; Wallis, Albrecht H.; Wulz, Klaus; and Izi, Kamuran, 4,330,480, Cl. 260-458.00R.

Beyl, Jean J. A., to Look. Combined ski boot and safety binding assembly. 4,330,138, Cl. 280-630.000.

Beyl, Jean J. A., to Look. Drilling and tapping jig for skis. 4,330,228, Cl. 408-112.000.

BFG Glassgroup: *See—*
Van Cauter, Albert; and Terneu, Robert, 4,330,318, Cl. 65-60.00C.

BICC Limited: *See—*
Gregory, Brian, 4,330,681, Cl. 174-14.00R.

Biechl, Jakob: *See—*
Worz, Helmut; Leuprecht, Hermann; and Biechl, Jakob, 4,330,375, Cl. 204-35.00R.

Bieganski, Zdzislaw. Wire stripping tools. 4,329,891, Cl. 81-9.50A.

Biegesen, David K.; Johnson, Noble M.; Bartlelink, Dirk J.; and Moyer, Marvin D., to Xerox Corporation. Thermal gradient control for

enhanced laser induced crystallization of predefined semiconductor areas. 4,330,363, Cl. 156-620.000.

Biggers, James V.: *See—*
Shrout, Thomas R.; Schulze, Walter A.; and Biggers, James V., 4,330,593, Cl. 428-407.000.

Billett, Ronald J.; Anderson, David N.; and Easter, William M., to FMC Corporation. Apparatus for producing frozen confections. 4,330,245, Cl. 425-126.00S.

Binnersley, Edwin K., to Du Pont de Nemours, E. I., and Company. Method for applying finish to a yarn. 4,329,750, Cl. 8-151.200.

Binns, Keith, to Dunlop Limited. Platform conveyors. 4,330,057, Cl. 198-334.000.

Biomedics, Inc.: *See—*
Babb, Albert L., 4,329,986, Cl. 128-214.00R.

Bird, Richard M.: *See—*
Beech, Harvey E.; and Bird, Richard M., 4,329,945, Cl. 123-25.00B.

Bisbing, Robert H., to Southco, Inc. Double-latch mechanism. 4,330,145, Cl. 292-37.000.

Bixby, James A.: *See—*
Colles, Joseph H.; Bixby, James A.; and Labeau, Gary A., 4,330,846, Cl. 364-900.000.

Bjork, Bengt A., to Nicator Aktiebolag. Method and device for checking the dimensions of vehicles. 4,329,784, Cl. 33-180.0AT.

Blackmon, Lawrence E.; Dees, John R.; and Mowe, Wayne T., to Fiber Industries, Inc. Wool-like yarn with moisture transport. 4,330,591, Cl. 428-369.000.

Blair, Henry E.; Charm, Stanley E.; and Crowley, Richard P., to Enzyme Center, Inc., The. Method of preparing high-activity, low-bacteria, urease enzyme. 4,330,626, Cl. 435-173.000.

Blecha, Bill A.: *See—*
Flogaus, William S.; and Blecha, Bill A., 4,329,826, Cl. 52-712.000.

Bleikamp, Roy H., Jr., to Monsanto Company. Insulated wire having a controlled specific gravity. 4,330,685, Cl. 174-101.500.

Blicha, Michael A. Potted plant water protection technique. 4,329,814, Cl. 47-79.000.

Blumrich, Walter; Dorr, Karl H.; Konig, Hans J.; and Sander, Ulrich, to Metallgesellschaft Aktiengesellschaft. Process of strengthening dilute phosphoric acid. 4,330,364, Cl. 159-47.00R.

Board of Regents, The University of Texas System: *See—*
Anthracite, Nancy E., 4,329,995, Cl. 128-350.00R.

Boden, Richard M.; Dekker, Lambert; Schmitt, Frederick L.; and Van Loveren, Augustinus G., to International Flavors & Fragrances Inc. Use of mixture of aliphatic C_{10} branched olefins in augmenting or enhancing the aroma of perfumes and/or perfumed articles. 4,330,415, Cl. 252-8.600.

Boden, Richard M., to International Flavors & Fragrances Inc. 1-N-Butoxy-1-ethanol acetate and uses thereof for augmenting or enhancing the aroma or taste of consumable materials. 4,330,417, Cl. 252-8.900.

Boden, Richard M.; Dekker, Lambert; Schmitt, Frederick L.; and Van Loveren, Augustinus G., to International Flavors & Fragrances Inc. Use of mixture of aliphatic C_{10} branched olefin epoxides in augmenting or enhancing the aroma of articles subjected to action of aqueous hypochlorites. 4,330,425, Cl. 252-187.00H.

Boehm, Valter; Maroszcyk, Veslav; Cieslar, Antonin; Bartuska, Miloslav; Rybak, Karel; Zverina, Karel; and Zelezny, Eduard, to Vysoka skola chemicko-technologicka. Method of bonding at least two types of ceramic materials to each other. 4,330,568, Cl. 427-34.000.

Boehmke, Gunther: *See—*
Schaupp, Kurt; Reitz, Gunther; and Boehmke, Gunther, 4,330,334, Cl. 106-90.000.

Boehringer Mannheim GmbH: *See—*
Friebe, Walter-Gunar; Winter, Werner; Thiel, Max; Roesch, Androniki; and Wilhelms, Otto-Henning, 4,330,549, Cl. 424-267.000.
Gruber, Wolfgang; Lenz, Helmut; Looser, Siegfried; and Linke, Hans-Ralf, 4,330,620, Cl. 435-7.000.

Boeing Company, The: *See—*
Harburn, Brian; and Miller, John C., 4,329,862, Cl. 72-53.000.

Bohm, Wolfgang, to Degussa AG. Work material of silver with tin and tungsten oxides for electrical contact. 4,330,330, Cl. 148-430.000.

Bohme, Jochen: *See—*
Jagieniak, Peter; Koerdt, Hans; Bohme, Jochen; Odrich, Dieter; Pochert, Rudolf; and Wiese, Peter, 4,330,700, Cl. 219-121.0PP.

Bohmer, Branislaw; Hoppe, Lutz; Szablikowski, Klaus; Kudora, Dieter; and Behn, Rudolf, to Wolff Walsrode Aktiengesellschaft. Solvent-soluble substances characterized in that water-soluble cellulose ethers are chemically bonded to water-soluble, at least predominately synthetic polymers containing acrylic units. 4,330,441, Cl. 525-54.230.

Boilko, Mikhail I.: *See—*
Kostandov, Leonid A.; Enikolopov, Nikolai S.; Dyachkovsky, Fridrikh S.; Novokshonova, Ljudmila A.; Gavrilov, Jury A.; Kudinova, Olga I.; Maklakova, Tatyana A.; Akopian, Leonid A.; Mchedlov-Petrosian, Otar P.; Boilko, Mikhail I.; Staroselsky, Alexandr A.; and Tkachenko, Vladimir P., 4,330,573, Cl. 427-213.000.

Boltersdorf, Dagmar; Junginger, Robert; Struck, Bernd D.; and Neumeister, Herbert, to Kernforschungsanlage Julich GmbH. Electrolysis cell and method for electrolytic production of hydrogen. 4,330,378, Cl. 204-104.000.

Boltizar, Pal: *See—*
Pietschmann, Frank; John, Gunter; Eistert, Theodor; Noack, Christian; Oliva, Klaus; Zumpe, Bernd; Spaida, Hans P.; Boltizar, Pal; Fabry, Istvan; Vida, Csongor; Lakos, Lajos; and Klement, Matjas, 4,329,832, Cl. 56-98.000.

Bonchek, Lawrence I., to Shiley, Inc. Vein distention system. 4,329,985, Cl. 128-214.00R.

Bonnaud, Bernard; and Pompon, Jean-Bernard, to Chloe Chimie. Continuous process for producing a finely divided aqueous disperson of a homogeneous phase of at least one fusible solid ingredient. 4,330,456, Cl. 524-46.000.

Bopst, John H., III. System for controlled and immediate sealing of structural joints and plaster line cracks. 4,330,355, Cl. 156-361.000.

Borden, Inc.: *See—*
Krueger, Bruno O., 4,330,437, Cl. 252-476.000.

Bordner, Dalton W., to Ameron, Inc. Filament-reinforced plastic article. 4,330,811, Cl. 361-212.000.

Borgert, Bernhard; and Liche, Udo, to Braas & Co. GmbH. Sealing element. 4,330,581, Cl. 428-64.000.

Boston, David R., to Minnesota Mining and Manufacturing Company. Photolithographic receptor sheet. 4,330,605, Cl. 430-14.000.

Botros, Radamis, to Northern Telecom Limited. Telephone group listening systems. 4,330,690, Cl. 179-81.00A.

Bouillon, Claude; Vayssie, Charles; and Richard, Francoise, to L'Oreal. Process of preparing 3-benzylidene-2-oxo-10-bomanesulfonic acid. 4,330,488, Cl. 260-511.000.

Bourne, Joseph R., to Carrier Corporation. Absorption refrigeration system. 4,329,851, Cl. 62-101.000.

Boutemy, Gerard E. M.: *See—*
Gorny, Bernard S. J. M.; Brun, Jean-Paul; Boutemy, Gerard E. M.; and Devif, Michel L., 4,330,323, Cl. 71-100.000.

Bowditch, Hoel L.: *See—*
Olsen, Everett O.; LaCroix, James R.; and Bowditch, Hoel L., 4,329,775, Cl. 29-602.00A.

Boze, Ronald A.; and Canzoneri, Anthony S., to Process Development Company. Dynamic clarifier system. 4,330,401, Cl. 210-106.000.

Braas & Co. GmbH: *See—*
Borgert, Bernhard; and Liche, Udo, 4,330,581, Cl. 428-64.000.

Braid, Milton, to Mobil Oil Corporation. Sulfurized phenol derivatives and compositions thereof. 4,330,421, Cl. 252-42.700.

Braitinger, Helmut: *See—*
Schneider, Franz; and Braitinger, Helmut, 4,330,810, Cl. 361-189.000.

Brand, Derek A.; Brand, Kenneth J.; and Brand, Derek R. Toy racing car game accessory. 4,330,127, Cl. 273-86.00B.

Brand, Derek R.: *See—*
Brand, Derek A.; Brand, Kenneth J.; and Brand, Derek R., 4,330,127, Cl. 273-86.00B.

Brand, Kenneth J.: *See—*
Brand, Derek A.; Brand, Kenneth J.; and Brand, Derek R., 4,330,127, Cl. 273-86.00B.

Brandes, Wilhelm: *See—*
Kraatz, Udo; Buchel, Karl H.; Stetter, Jorg; Frohberger, Paul-Ernst; and Brandes, Wilhelm, 4,330,547, Cl. 424-263.000.

Brandmaier, C. Edward: *See—*
Dennis, Edmund G.; and Brandmaier, C. Edward, 4,329,900, Cl. 83-355.000.

Branstner, Richard L., to Tyco Industries, Inc. Positive mesh gearing system for toy cars. 4,329,886, Cl. 74-416.000.

Bratton, Robert H., to Mobil Oil Corporation. Common-offset-distance seismic trace filtering. 4,330,872, Cl. 367-43.000.

Braun, Rudiger, to Siemens Aktiengesellschaft. Circuit for forming periodic pulse patterns. 4,330,820, Cl. 363-135.000.

Braupatent Universal AG: *See—*
Kuhtreiber, Franz, 4,329,918, Cl. 99-276.000.

Brecher, Lee E.; and Wu, Christopher K., to Westinghouse Electric Corp. Decomposition of water. 4,330,523, Cl. 423-579.000.

Brenneman, William: *See—*
Winter, Joseph; Brenneman, William; and Fister, Julius C., 4,330,599, Cl. 428-675.000.

Brennen, John F.: *See—*
Alvarez, Joseph A., III; Bensadon, Joseph M.; Brennen, John F.; and Krug, Robert W., 4,330,857, Cl. 370-104.000.

Brewer, James L. Adapter for transporting hay feeders. 4,330,231, Cl. 414-24.500.

Bridgestone Tire Company Limited: *See—*
Muramatsu, Tateo; and Kurihara, Mamoru, 4,330,224, Cl. 405-115.000.
Tsukamoto, Takehiro; Takeshita, Michitaka; and Tomita, Seisuke, 4,330,592, Cl. 428-378.000.

Brierley, David; Ridyard, Denis R. A.; and Yelland, Michael, to Imperial Chemical Industries, Limited. Water soluble monoazo dyes for nylon. 4,330,468, Cl. 260-198.000.

Britax Weathershields Limited: *See—*
Fisher, Sidney E.; and Hunt, Keith R., 4,329,917, Cl. 98-2.140.

British Gas Corporation: *See—*
Holden, Ernest M., 4,330,748, Cl. 324-225.000.

British Petroleum Company Limited, The: *See—*
Cairns, Roger J. R., 4,330,300, Cl. 44-51.000.
Reece, Alan R., 4,329,793, Cl. 37-98.000.
Webb, Michael G., 4,330,223, Cl. 405-63.000.

Brotzmann, Karl; and Fassbinder, Hans-Georg, to Eisenwerk-Gesellschaft Maximilianshutte mbH. Method and a means for introducing close-grained carbonaceous fuels into a molten iron bath. 4,330,326, Cl. 75-60.000.

Brower, Boyd G.; and Shaffer, John W., to GTE Products Corporation. Radiation switch for photoflash unit. 4,330,821, Cl. 362-4.000.

Brown, George A.: *See—*
Neyhart, James H.; Brown, George A.; Relyea, Lloyd A.; Scharfe, Merlin E.; and Pinsler, Heinz W., 4,330,609, Cl. 430-126.000.

Brown, Paul: *See—*
Rees, Herbert; Brown, Paul; and Grund, Miroslaw, 4,330,257, Cl. 425-556.000.

Brown, Robert L. Lure with interlocking attachment. 4,329,804, Cl. 43-42.090.

Browning Arms Company: *See*—
Johnson, Myron L.; and Badali, Joseph A., 4,329,803, Cl. 42-84.000.

Brun, Jean-Paul: *See*—
Gorny, Bernard S. J. M.; Brun, Jean-Paul; Boutemy, Gerard E. M.; and Devif, Michel L., 4,330,323, Cl. 71-100.000.

Brunelle, Daniel J., to General Electric Company. Polycarbonate transesterification with catalyst containing aluminum hydride or borohydride group. 4,330,664, Cl. 528-198.000.

Brunswick Corporation: *See*—
Rumble, Joseph W., 4,330,126, Cl. 273-80.00R.

Buchel, Karl H.: *See*—
Kraatz, Udo; Buchel, Karl H.; Stetter, Jorg; Frohberger, Paul-Ernst; and Brandes, Wilhelm, 4,330,547, Cl. 424-263.000.

Buchner, Helmut; and Bernauer, Otto, to Daimler-Benz Aktiengesellschaft. Method for operating a heating power plant and heating power plant for carrying out the method. 4,330,084, Cl. 237-12.100.

Buchwalter, Stephen L., to PPG Industries, Inc. Novel acrylic polymers and the Michael adducts thereof useful in coating applications. 4,330,640, Cl. 524-555.000.

Buderus Aktiengesellschaft: *See*—
Debus, Gerhard; Hof, Erwin; and Herrmann, Gunter, 4,329,975, Cl. 126-192.000.

Budzich, Tadeusz. Exhaust pressurization of load responsive system. 4,330,009, Cl. 137-596.130.

Bugaut, Andree; and Jeanminet, Ginette. Nitrated coupler compounds useful in direct dyeing and simultaneous oxidation and direct dyeing of keratinic fibers. 4,330,291, Cl. 8-406.000.

Bugaut, Andree; Vandenbossche, Jean-Jacques M.; Shahin, Majdi M.; and Kalopissis, Gregoire, to L'Oreal. Dyeing compositions for keratin fibres containing meta-phenylenediamines. 4,330,292, Cl. 8-411.000.

Bull, Ada M.; and Bull, George R. Transparent overlay device for protecting mesh screening. 4,330,022, Cl. 160-379.000.

Bull, George R.: *See*—
Bull, Ada M.; and Bull, George R., 4,330,022, Cl. 160-379.000.

Bull, Hans: *See*—
Welzel, Josef; Bull, Hans; and Maykemper, Alfred, 4,330,226, Cl. 405-291.000.

Bullard, Herbert L., to Goodyear Tire & Rubber Company, The. High softening point synthetic resin. 4,330,655, Cl. 526-283.000.

Bullock, Kenneth W.; and Carruthers, Eben H. Food packing machinery with differential force-controlled packing action. 4,330,252, Cl. 425-412.000.

Bunker Ramo Corporation: *See*—
Monaghan, Kevin J.; Schwickert, Russell C.; and Esposito, John J., 4,330,172, Cl. 350-96.210.

Buraas, Vincent. Oil control system for piston-type airplane engines. 4,329,952, Cl. 123-196.0AB.

Burgio, Antonio, to Fiat Auto S.p.A. Diesel cycle engine having a precombustion chamber. 4,329,956, Cl. 123-286.000.

Burkes, Bobby: *See*—
Timberlake, John F.; Baugh, Daniel W., Jr.; and Burkes, Bobby, 4,330,481, Cl. 260-463.000.

Burkey, Bruce C.: *See*—
Anagnostopoulos, Constantine N.; Lee, Teh-Hsuang; Burkey, Bruce C.; and Lavine, James P., 4,330,796, Cl. 358-213.000.

Burns, Carmen D., to National Semiconductor Corporation. Tape operated semiconductor device packaging. 4,330,790, Cl. 357-70.000.

Burns and Russell Company, The: *See*—
Russell, Alexander H., 4,329,822, Cl. 52-309.160.

Burroughs Corporation: *See*—
DeMoss, Dean, 4,330,804, Cl. 360-102.000.
Dodson, Bill R., 4,330,822, Cl. 364-200.000.

Burroughs Wellcome Co.: *See*—
Doubleday, Ian E., 4,330,070, Cl. 222-43.000.

Burton, Charles A.: *See*—
Russell, Robert C.; Burton, Charles A.; Coleman, Ronald K.; and Schroeder, Dwain R., 4,330,288, Cl. 493-197.000.

Burton, Donald J.; and Flynn, Richard M., to University of Iowa Foundation. Bis(phosphonic acid) difluoromethane. 4,330,486, Cl. 260-502.40P.

Burton, Robert E. Burning system and method. 4,329,931, Cl. 110-346.000.

Busacca, Guido; Meli, Vincenzo; and Rossi, Antonio, to Societa Italiana Telecomunicazioni Siemens S.p.A. System for correlating the operating frequencies of two variable-frequency microwave generators. 4,330,760, Cl. 331-55.000.

Busch, Wolfram: *See*—
Becker, Udo; Busch, Wolfram; Fischer, Johann P.; and Sommer, Werner, 4,329,992, Cl. 128-272.000.

Buschmann, Ernst: *See*—
Acker, Rolf-Dieter; Buschmann, Ernst; Thym, Sabine; Zeeh, Bernd; and Pommer, Ernst-Heinrich, 4,330,535, Cl. 424-184.000.

Butterfield, John P., to Jude Engineering Inc. Stuffing box with bellows to allow shaft gyratory movements. 4,330,135, Cl. 277-102.000.

Button, Kenneth J.: *See*—
Cohn, Daniel R.; Lax, Benjamin; and Button, Kenneth J., 4,330,761, Cl. 372-4.000.

Buysch, Hans-Josef: *See*—
Krimm, Heinrich; Buysch, Hans-Josef; and Rudolph, Hans, 4,330,665, Cl. 528-200.000.

Byrne, Michael, to General Electric Company. Locking support arrangement for a flexible sound-generating diaphragm. 4,330,729, Cl. 310-322.000.

CAE Machinery Ltd.: *See*—
Stroud, Brian T., 4,329,901, Cl. 83-819.000.

Cairns, Donald F.; and Metzger, Daniel J., to National Steel Corporation. Coke oven emission control method and apparatus. 4,330,372, Cl. 201-41.000.

Cairns, James A.; Antill, John E.; and Noakes, Michael L., to United Kingdom Atomic Energy Authority. Catalyst supports and fluid treatment devices. 4,330,436, Cl. 252-466.00J.

Cairns, Roger J. R., to British Petroleum Company Limited, The. Coal oil mixtures. 4,330,300, Cl. 44-51.000.

Calligaro, Michel, to Thomson-CSF. Silicon resistor having a very low temperature coefficient. 4,329,774, Cl. 29-583.000.

Calundann, Gordon W.: *See*—
East, Anthony J.; Charbonneau, Larry F.; and Calundann, Gordon W., 4,330,457, Cl. 524-602.000.

Cameron, Russell J., to Ross Operating Valve Company. Valve safety indicating means. 4,330,013, Cl. 137-637.100.

Campbell, Donald H.; and Quinn, Edward J., to Hooker Chemicals & Plastics Corp. Preparation of phosphorous acid from industrial waste material containing phosphites. 4,330,515, Cl. 423-316.000.

Canadian Patents & Development Limited: *See*—
Johnson, Derwyn C.; Kawasaki, Brian S.; and Hill, Kenneth O., 4,330,170, Cl. 350-96.160.

Canon Kabushiki Kaisha: *See*—
Fujibayashi, Kazuo; and Momiyama, Kikuo, 4,330,188, Cl. 354-200.000.
Kawai, Tohoru, 4,330,176, Cl. 350-252.000.
Komori, Shigehiro; Sakamaki, Hisashi; Hattori, Hiroyuki; Iida, Toshihide; Miyamoto, Koichi; and Umezawa, Kazumi, 4,330,199, Cl. 355-14.0CH.
Sato, Yasushi; Takatori, Yasushi; Hara, Toshitami; and Shirato, Yoshiaki, 4,330,787, Cl. 346-140.00R.
Shimizu, Seiichi, 4,330,192, Cl. 354-286.000.
Tanaka, Kazuo, 4,330,180, Cl. 350-427.000.
Yokota, Hideo, 4,330,202, Cl. 356-1.000.

Canzoneri, Anthony S.: *See*—
Boze, Ronald A.; and Canzoneri, Anthony S., 4,330,401, Cl. 210-106.000.

Car, Joe P.: *See*—
Lollis, Glen R.; Marler, Marvin G.; Car, Joe P.; and John, Sam J., 4,330,076, Cl. 228-119.000.

Carl, William P.: *See*—
Ezzell, Bobby R.; Carl, William P.; and Mod, William A., 4,330,654, Cl. 526-243.000.

Carl Zeiss-Stiftung: *See*—
Gausmann, Hans; and Geis, Walter, 4,330,206, Cl. 356-246.000.

Carlisle, Richard S. Horticultural devices. 4,329,812, Cl. 47-59.000.

Carlton, Wayne H. Process to recycle bituminous roofing refuse into solid fuel and other energy-related products. 4,330,340, Cl. 106-281.00R.

Carr, J. Richard. Flying saucer bowling game. 4,330,130, Cl. 273-393.000.

Carrier Corporation: *See*—
Bourne, Joseph R., 4,329,851, Cl. 62-101.000.

Carruthers, Eben H.: *See*—
Bullock, Kenneth W.; and Carruthers, Eben H., 4,330,252, Cl. 425-412.000.

Carson, Chester C.: *See*—
Sawada, Fred H.; Barton, Sterling C.; Echeverria, Federico S.; and Carson, Chester C., 4,330,808, Cl. 361-25.000.

Carter, Gilbert J. Free standing, multiple skein yarn holder and dispenser. 4,330,095, Cl. 242-129.500.

Caruel, Jacques E. J.; Gastebois, Philippe M. D.; and Coutor, Simone, to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation. Cooling of combustion chamber walls using a film of air. 4,329,848, Cl. 60-757.000.

Cashin Systems Corporation: *See*—
Dennis, Edmund G.; and Brandmaier, C Edward, 4,329,900, Cl. 83-355.000.

Castonguay, Richard N.: *See*—
King, John J.; Sellers, Ralph F.; and Castonguay, Richard N., 4,330,659, Cl. 528-99.000.

Cate, Robert R., to Deere & Company. Heat exchanger isolation mounting arrangement. 4,330,030, Cl. 165-67.000.

Cavazza, Claudio. Acyl-carnitine and use thereof in parenteral administration of triglycerides. 4,330,557, Cl. 424-316.000.

Celanese Corporation: *See*—
East, Anthony J.; Charbonneau, Larry F.; and Calundann, Gordon W., 4,330,457, Cl. 524-602.000.
Hannon, Martin J.; Vyas, Rajal M.; and Schwarz, Rudolph R., 4,330,672, Cl. 528-493.000.
Hughes, O. Richard, 4,330,434, Cl. 252-430.000.

CEM Compagnie Electro-Mecanique: *See*—
Sterlini, Jacques, 4,329,788, Cl. 34-27.000.

Centrilift-Hughes, Inc.: *See*—
Salant, Richard F., 4,330,306, Cl. 55-159.000.
Shell, Lewis R.; and Vandevier, Joseph E., 4,330,740, Cl. 318-780.000.

Centro Ricerche Fiat S.p.A.: *See*—
Ruspa, Giacomo; and Franco, Luigi, 4,330,047, Cl. 181-224.000.

Cerami, Anthony, to Evreka, Inc. Article and method for measuring glucose level in body fluids. 4,330,299, Cl. 23-230.00B.

Chadwick, Russell D. Valve for aerial spraying. 4,330,012, Cl. 137-625.480.

Chan, Kwok Yan, to W. Haking Enterprises Limited. Pocket camera. 4,330,190, Cl. 354-275.000.

Chapman, Ivan B., Jr., to Western Electric Company, Inc. Thumb-controlled hand-held tool. 4,330,093, Cl. 242-7.170.

Charbonneau, Larry F.: *See—*
East, Anthony J.; Charbonneau, Larry F.; and Calundann, Gordon W., 4,330,457, Cl. 524-602.000.

Charles, Harry R.: *See—*
Miles, Donald L.; and Charles, Harry R., 4,330,345, Cl. 148-6.15Z.

Charm, Stanley E.: *See—*
Blair, Henry E.; Charm, Stanley E.; and Crowley, Richard P., 4,330,626, Cl. 435-173.000.

CHB Foods, Inc.: *See—*
Nassar, Abdalla E., 4,330,562, Cl. 426-310.000.

Chemfil Corporation: *See—*
Miles, Donald L.; and Charles, Harry R., 4,330,345, Cl. 148-6.15Z.

Chemische Werke Huels, A.G.: *See—*
Nehring, Rudolf, 4,330,474, Cl. 549-367.000.

Chemische Werke Huls Aktiengesellschaft: *See—*
Disteldorf, Josef; Flakus, Werner; and Schnurbusch, Horst, 4,330,657, Cl. 528-58.000.

Chen, Wen-Hsien; and Lean, Eric G., to International Business Machines Corporation. Method and apparatus for acoustic scanning using bulk wave scattering of bulk waves by an acoustic grating. 4,329,876, Cl. 73-618.000.

Cheng, Chung-Kae C., to General Electric Company. Electronic control system for coffeemaker. 4,330,702, Cl. 219-492.000.

Cheng, Jiin-Duey, to Du Pont de Nemours, E. I., and Company. Carbamoyl sulfide fluorides. 4,330,674, Cl. 549-11.000.

Cherkofsky, Saul C., to Du Pont de Nemours, E. I., and Company. Antiinflammatory 4,5-diaryl-2-arylthioimidazoles. 4,330,552, Cl. 424-273.00R.

Cheskis, Harvey P.: *See—*
Tyler, Derek E.; Cheskis, Harvey P.; Stone, Louis P.; and Pryor, Michael J., 4,330,328, Cl. 75-76.000.

Chevron Research Company: *See—*
Miller, Stephen J., 4,330,396, Cl. 208-136.000.
Rosenthal, Joel W.; and Dahlberg, Arthur J., 4,330,389, Cl. 208-10.000.
Rosenthal, Joel W.; and Dahlberg, Arthur J., 4,330,390, Cl. 208-10.000.
Rosenthal, Joel W.; and Dahlberg, Arthur J., 4,330,391, Cl. 208-10.000.
Rosenthal, Joel W.; and Dahlberg, Arthur J., 4,330,393, Cl. 208-10.000.
Sieg, Robert P., 4,330,397, Cl. 208-149.000.

Chiang, David, to MCC Associates. Method of determining operating parameters for a stepping motor. 4,330,739, Cl. 318-696.000.

Chicoine, Russell G.; and Medici, Salvatore L. Hot water extraction carpet and floor cleaning machine. 4,329,756, Cl. 15-321.000.

Chien-Tung, Chen. Fused electric plug. 4,330,167, Cl. 339-147.00P.

Chikazawa, Nobumoto: *See—*
Arima, Teruo; Machii, Kenji; Chikazawa, Nobumoto; Takeuchi, Tetsuya; and Fujii, Setsuro, 4,330,527, Cl. 424-94.000.

Chinoin Gyogyszer es Vegyeszeti Termekek Gyara R.T.: *See—*
Simonidesz, Vilmos; Papp nee Behr, Agnes; Kovacs, Gabor; Ivanics, Jozsef; Der nee Foldvary, Julia; Stadler, Istvan; and Pallagi, Istvan, 4,330,553, Cl. 424-285.000.

Chisholm, Douglas B. Guard rail construction. 4,330,106, Cl. 256-13.100.

Chloe Chimie: *See—*
Bonnaud, Bernard; and Pompon, Jean-Bernard, 4,330,456, Cl. 524-46.000.

Choquet, Michel F., to International Business Machines Corporation. Time domain supervisory channel for data terminal equipments. 4,330,858, Cl. 370-111.000.

Christ, Richard: *See—*
Ahner, Stefan; Christ, Richard; Klein, Dieter; and Srostlik, Peter, 4,330,711, Cl. 250-506.000.

Christensson, Od W. Apparatus for manufacturing a lined container. 4,330,289, Cl. 493-100.000.

Christie, Thomas D.; Ballantine, Robert K.; and Moreau, Pierre A., to BCM Manufacturing Ltd. Flooring unit. 4,329,939, Cl. 119-28.000.

Christman, Donald L.; and Kan, Peter T., to BASF Wyandotte Corporation. Carbamylbiuret-modified polyisocyanates. 4,330,636, Cl. 521-155.000.

Christou, Aristos; and Davey, John E., to United States of America, Navy. Refractory passivated ion-implanted GaAs ohmic contacts. 4,330,343, Cl. 148-1.500.

Chu, Shieh C. Refractory sagger. 4,330,269, Cl. 432-258.000.

Chugai Seiyaku Kabushiki Kaisha: *See—*
Nemoto, Kaoru; Ogasawara, Toshichika; and Bessho, Sadao, 4,330,561, Cl. 426-140.000.

Churgovich, Dennis M.; Joest, William F., III; McCray, William R.; and Rutkowski, Edward V., Jr., to International Business Machines Corporation. Line adjustment apparatus for a typewriter. 4,330,217, Cl. 400-64.000.

Ciba-Geigy Corporation: *See—*
Gati, Sandor; and Holzle, Gerd, 4,330,469, Cl. 260-242.200.
Hubele, Adolf; Eckhardt, Wolfgang; and Kunz, Walter, 4,330,556, Cl. 424-309.000.
King, John J.; Sellers, Ralph F.; and Castonguay, Richard N., 4,330,659, Cl. 528-99.000.
Pissiotas, Georg; and Beriger, Ernst, 4,330,536, Cl. 424-200.000.

Ciesla, Michael: *See—*
Kremheller, Hermann; and Ciesla, Michael, 4,330,268, Cl. 432-246.000.

Cieslar, Antonin: *See—*
Boehm, Valter; Marosczyk, Veslav; Cieslar, Antonin; Bartuska, Miloslav; Rybak, Karel; Zverina, Karel; and Zelezny, Eduard, 4,330,568, Cl. 427-34.000.

Cigognetti, Edoardo. Inflatable boat. 4,329,751, Cl. 114-345.000.

Citizen Watch Co., Ltd.: *See—*
Nakamura, Seiichi, 4,330,878, Cl. 368-250.000.

Clark, Gary L. Camera accessory bag. 4,330,073, Cl. 224-223.000.

Clark, Gary T.: *See—*
Fleischer, Jean C.; Maner, Ronald J.; and Clark, Gary T., 4,330,467, Cl. 260-155.000.

Clausen, Poul J. Timetable holder to be placed on a post at a bus or street car stop. 4,329,801, Cl. 40-607.000.

Clay, Wallace C.: *See—*
Heyer, Arthur J.; Springer, Edward M.; and Clay, Wallace C., 4,330,798, Cl. 358-291.000.

Clifford, Douglas M.: *See—*
Miller, Bradley W.; Hickenlooper, Franklin T.; Uhlrich, David C.; Godfrey, Marl D.; Clifford, Douglas M.; James, Rex L.; Watson, Robert E.; Keith, John C.; and Mortensen, Allen C., 4,330,839, Cl. 364-706.000.

Clifford, Earl W., to Aro Corporation, The. Smoke generator. 4,330,428, Cl. 252-359.0CG.

Coal Industry (Patents) Limited: *See—*
Newman, John O. H., 4,330,394, Cl. 208-23.000.

Cockram, David R.; and Fyles, Kenneth M., to Pilkington Brothers Limited. Alkali-resistant glass fibres. 4,330,628, Cl. 501-38.000.

Cohn, Daniel R.; Lax, Benjamin; and Button, Kenneth J., to Massachusetts Institute of Technology. High power gas laser. 4,330,761, Cl. 372-4.000.

Colato, Albert E.: *See—*
Danley, Allen M.; and Colato, Albert E., 4,330,697, Cl. 219-10.55F.
Pomeroy, James F.; Colato, Albert E.; Danley, Allen M.; and Gerling, John E., 4,330,696, Cl. 219-10.55F.

Coleman, Allen K., to United Technologies Corporation. Phase adjustment circuit. 4,330,717, Cl. 307-46.000.

Coleman, John H., to Plasma Physics Corporation. Method of forming semiconducting materials and barriers. 4,330,182, Cl. 352-2.000.

Coleman, Ronald K.: *See—*
Russell, Robert C.; Burton, Charles A.; Coleman, Ronald K.; and Schroeder, Dwain R., 4,330,288, Cl. 493-197.000.

Colgate Palmolive Company: *See—*
Joshi, David, 4,330,424, Cl. 252-135.000.

College of Medicine and Dentistry of New Jersey: *See—*
Alexander, Harold; Parsons, John R.; Strauchler, Irving D.; and Weiss, Andrew B., 4,329,743, Cl. 3-1.000.

Colles, Joseph H.; Bixby, James A.; and Labeau, Gary A., to Eastman Technology, Inc. Digital time base correction. 4,330,846, Cl. 364-900.000.

Colley, Rowan H., to Rolls-Royce Limited. Rotor tip clearance control apparatus for a gas turbine engine. 4,330,234, Cl. 415-171.000.

Collins, Philip W., to Minnesota Mining and Manufacturing Company. Dispenser for liner-wound tape. 4,330,357, Cl. 156-584.000.

Combustion Engineering, Inc.: *See—*
Musick, Charles R., 4,330,367, Cl. 376-245.000.

Cominco Ltd.: *See—*
Bexton, Stewart G.; Hildred, Gordon C.; Higgins, John T.; and Whitham, James G., 4,330,319, Cl. 71-28.000.

Comitato Nazionale per l'Energia Nucleare-CNEN: *See—*
Tommasino, Luigi; and Zapparoli, Giorgio, 4,330,710, Cl. 250-472.000.

Commissariat a l'Energie Atomique: *See—*
Deutsch, Jean-Claude, 4,330,813, Cl. 362-244.000.
Eloy, Jean-Francois, 4,330,208, Cl. 356-318.000.
Garin, Arlette; Rouger, Michel; and Saudinos, Jean, 4,330,731, Cl. 313-104.000.

Communications Satellite Corporation: *See—*
Pentlicki, Chester J., 4,330,766, Cl. 333-105.000.

Compagnie Francaise des Peteroles: *See—*
Minkiewicz, Andre E.; and Poirier, Norbert, 4,330,074, Cl. 228-29.000.

Compagnie Generale d'Electricite: *See—*
Desplanches, Gerard; and LeClerc, Gerard, 4,330,496, Cl. 264-57.000.

Compagnie Internationale Pour l'Informatique Cii Honeywell Bull (Societe Anonyme): *See—*
Girard, Paul, 4,330,825, Cl. 364-200.000.
Girard, Paul M., 4,330,824, Cl. 364-200.000.

Conoco Inc.: *See—*
Lancet, Michael S.; Curran, George P.; and Gorin, Everett, 4,330,430, Cl. 252-420.000.

Conway, Tim D.; and Paddock, Paul F., to Sunkist Growers, Inc. Method and apparatus for measuring the surface color of an article. 4,330,062, Cl. 209-582.000.

Cook, Frank T., to Dow Chemical Company, The. Plasticizers for polyvinylchloride comprising a reaction product of alkanedicarboxic acid and alkanolether. 4,330,452, Cl. 524-308.000.

Cookson, Alan H.: *See—*
Dale, Steinar J.; and Cookson, Alan H., 4,330,682, Cl. 174-14.00R.

Coombs, Peter M.; Playdon, Gary W.; and Koczela, Jeffrey J. Sheet delivery apparatus with horizontal plate. 4,330,114, Cl. 271-22.000.

Coonan Arms, Inc.: *See—*
Coonan, Daniel J., 4,329,802, Cl. 42-50.000.

Coonan, Daniel J., to Coonan Arms, Inc. Magazine for large-caliber handguns. 4,329,802, Cl. 42-50.000.

Cooper, Earl A.; and Hallenbeck, Bennett L., to Automation Industries, Inc. Electrical connector substantially shielded against EMP and EMI energy. 4,330,166, Cl. 339-143.00R.
Cooper, Robert P., to American Hospital Supply Corporation. Multilumen catheter. 4,329,994, Cl. 128-349.00B.
Cooper, Robert P.: *See—*
Lieber, Clement E.; Cooper, Robert P.; and Estes, Michael S., 4,329,993, Cl. 128-349.00B.
Copeland, Stephen A. Protective pacifier. 4,329,996, Cl. 128-359.000.
Corkle, David B.: *See—*
Nelson, Theodore W., Jr.; Corkle, David B.; Wolfe, Joel Z.; and Ganzel, Larry A., 4,330,511, Cl. 423-210.000.
Corning Glass Works: *See—*
Allaire, Roger A.; Pardue, William F., Jr.; and VanDewoestine, Robert V., 4,330,503, Cl. 422-177.000.
Cunningham, George M., 4,330,254, Cl. 425-466.000.
Noll, Burton A.; and Suhey, Richard P., 4,330,029, Cl. 165-8.000.
Pujari, Vimal K.; and Trentelman, Jackson P., 4,330,028, Cl. 165-1.000.
Coughlin, William J.; Johnson, David E.; and McCall, Kenneth E., to Arcair Company. Heavy duty carriage assembly. 4,330,109, Cl. 266-67.000.
Coulson, Don J., to North Star Company, Inc. Metal grape stake. 4,329,811, Cl. 47-46.000.
Coury, Glenn E. Method of separating a noncondensable gas from a condensable vapor. 4,330,307, Cl. 62-23.000.
Coutor, Simone: *See—*
Caruel, Jacques E. J.; Gastebois, Philippe M. D.; and Coutor, Simone, 4,329,848, Cl. 60-757.000.
CR Industries: *See—*
Reichenbach, Jerry D.; and Passarelli, Jamie R., 4,330,256, Cl. 425-537.000.
Crane Co.: *See—*
McClure, Charles A., 4,330,408, Cl. 210-619.000.
Creech, Clyde W. Apparatus and method for cutting holes in steel plates. 4,330,110, Cl. 266-70.000.
Cronin, Dennis C., to Beloit Corporation. Extended nip press. 4,330,023, Cl. 162-358.000.
Crosgrove, Robert O.: *See—*
Larson, Elmer M.; Moody, Edward; and Crosgrove, Robert O., 4,330,368, Cl. 376-460.000.
Crowley, Richard P.: *See—*
Blair, Henry E.; Charm, Stanley E.; and Crowley, Richard P., 4,330,626, Cl. 435-173.000.
Crown International, Inc.: *See—*
Stanley, Gerald R., 4,330,809, Cl. 361-103.000.
Crown Zellerbach Corporation: *See—*
Weinert, Lawrence E., 4,330,064, Cl. 209-617.000.
Croydon, Frederic G., to Omark Industries, Inc. Drill bit. 4,330,229, Cl. 408-212.000.
CSELT - Centro Studi e Laboratori Telecomunicazioni S.p.A.: *See—*
Impallomeni, Enrico; and Montagna, Roberto, 4,330,861, Cl. 375-15.000.
Tiribelli, Paolo, 4,330,688, Cl. 179-8.00A.
Cummings, William M.; and Powell, Justin C., to Texaco Inc. Detergent fuel composition. 4,330,303, Cl. 44-63.000.
Cunningham, George M., to Corning Glass Works. Extrusion die conversion. 4,330,254, Cl. 425-466.000.
Curran, George P.: *See—*
Lancet, Michael S.; Curran, George P.; and Gorin, Everett, 4,330,430, Cl. 252-420.000.
Currie, Sara A.: *See—*
Tejera, Enrique; Currie, Sara A.; Flor, James E.; and Monaghan, Richard L., 4,330,624, Cl. 435-75.000.
Currier Piano Company, Inc.: *See—*
Mayerjak, Robert J., 4,329,903, Cl. 84-186.00R.
Curtius, Friedrich: *See—*
Florin, Gerd; Curtius, Friedrich; and Dentler, Arthur, 4,330,411, Cl. 210-769.000.
Curty, Societe Anonyme: *See—*
Eyrard, Pierre; and Poquet, Jean-Paul, 4,330,585, Cl. 428-131.000.
Cuschera, Casper. Shower receptor drain. 4,329,744, Cl. 4-292.000.
Cybulski, Mark J.; Gumkowski, Bert A.; and Portolese, Larry A., to Bendix Corporation, The. Disc brake assembly and resilient member therefor. 4,330,049, Cl. 188-73.360.
Dahlberg, Arthur J.: *See—*
Rosenthal, Joel W.; and Dahlberg, Arthur J., 4,330,389, Cl. 208-10.000.
Rosenthal, Joel W.; and Dahlberg, Arthur J., 4,330,390, Cl. 208-10.000.
Rosenthal, Joel W.; and Dahlberg, Arthur J., 4,330,391, Cl. 208-10.000.
Rosenthal, Joel W.; and Dahlberg, Arthur J., 4,330,393, Cl. 208-10.000.
Daigle, Vincent J. Shock-socket. 4,329,892, Cl. 81-55.000.
Daimler-Benz Aktiengesellschaft: *See—*
Buchner, Helmut; and Bernauer, Otto, 4,330,084, Cl. 237-12.100.
Grossner, Horst; Dudeck, Ingo; and Maass, Manfred, 4,329,871, Cl. 73-35.000.
Dale, Steinar J.; and Cookson, Alan H., to United States of America, Energy. Hybrid particle traps and conditioning procedure for gas insulated transmission lines. 4,330,682, Cl. 174-14.00R.
Dalier, Paul H.: *See—*
Sheffield, Marion C.; and Dalier, Paul H., 4,330,043, Cl. 175-406.000.
Dalle & Cie, S.A.: *See—*
Dalle, Joel, 4,330,580, Cl. 428-43.000.
Dalle, Joel, to Dalle & Cie, S.A. Process for manufacture of wall coverings and wall coverings thus obtained. 4,330,580, Cl. 428-43.000.
Dallons, Robert E.; and Fortune, William S., to Edsyn, Inc. Liquid dispenser. 4,329,989, Cl. 128-218.00R.
D'Alonzo, Lodovico. Self-proportional fluid metering device actuated by a pressurized fluid. 4,330,003, Cl. 137-100.000.
Damerau, Frederick J., to International Business Machines Corporation. Guess-ahead feature for a keyboard-display terminal data input system. 4,330,845, Cl. 364-900.000.
D'Amore, Frank J.: *See—*
Wood, William A.; and D'Amore, Frank J., 4,330,087, Cl. 239-233.000.
Daniels, R. Gary; Bennett, Thomas H.; and Wiles, Michael F. Valid memory address pin elimination. 4,330,842, Cl. 364-900.000.
Danley, Allen M.; and Colato, Albert E., to Plastics, Inc. Drive motor assembly for use in a microwave oven. 4,330,697, Cl. 219-10.55F.
Danley, Allen M.: *See—*
Pomeroy, James F.; Colato, Albert E.; Danley, Allen M.; and Gerling, John E., 4,330,696, Cl. 219-10.55F.
Data General Corporation: *See—*
Retter, Charles T., 4,330,823, Cl. 364-200.000.
Datapoint Corporation: *See—*
Arends, Thomas C., 4,330,870, Cl. 455-617.000.
Datta, Pabitra; and Poliniak, Eugene S., to RCA Corporation. High density information record lubricants. 4,330,583, Cl. 428-65.000.
Davey, John E.: *See—*
Christou, Aristos; and Davey, John E., 4,330,343, Cl. 148-1.500.
Davies, Julian E.; and Harford, Stephen, to Wisconsin Alumni Research Foundation. Assay for aminoglycosides. 4,330,621, Cl. 435-15.000.
Davis, Kent L.; and Palm, Lowell L. Vacuum disc filter. 4,330,405, Cl. 210-331.000.
Davister, Armand L., to Societe de Prayon. Multiple cell filter with baffles. 4,330,404, Cl. 210-247.000.
Davy, L. Nevil, to Eastman Kodak Company. Method and apparatus for recovering a signal from a charge transfer device. 4,330,753, Cl. 329-50.000.
Davy McKee Aktiengesellschaft: *See—*
Roller, Gunter, 4,330,520, Cl. 423-392.000.
Dayco Corporation: *See—*
Kleykamp, Donald L.; and Neroni, Peter J., 4,330,498, Cl. 264-251.000.
Somers, M. John, 4,329,780, Cl. 29-848.000.
De Soto, Inc.: *See—*
Killeen, James J.; Plaisance, Thomas H.; and Sekmakas, Kazys, 4,330,445, Cl. 525-501.500.
Dean, Ralph T.; Sealer, David A.; and Hellums, James R., to Mostek Corporation. Single electrode sense circuit for charge-coupled transversal filters. 4,330,769, Cl. 333-165.000.
Debus, Gerhard; Hof, Erwin; and Herrmann, Gunter, to Buderus Aktiengesellschaft. Solid fuel stove utilizable as a fireplace. 4,329,975, Cl. 126-192.000.
de Chambost, Emmanuel, to Thomson-CSF. Electronic optical objective. 4,330,709, Cl. 250-396.0ML.
Deere & Company: *See—*
Cate, Robert R., 4,330,030, Cl. 165-67.000.
Kittle, Carl E.; and Price, James L., 4,329,857, Cl. 220-229.000.
Peiler, Rolf W., 4,330,000, Cl. 130-27.00L.
Deering, John J. Convenient draft-free safety window. 4,330,021, Cl. 160-91.000.
Dees, John R.: *See—*
Blackmon, Lawrence E.; Dees, John R.; and Mowe, Wayne T., 4,330,591, Cl. 428-369.000.
de Graaf, Johannes D.: *See—*
O'Keefe, Dennis R.; McCorkle, Kenneth H., Jr.; and de Graaf, Johannes D., 4,330,374, Cl. 203-12.000.
Degraeve, Francois: *See—*
Paramythioti, Michel; and Degraeve, Francois, 4,330,738, Cl. 318-128.000.
Degussa AG: *See—*
Bohm, Wolfgang, 4,330,330, Cl. 148-430.000.
Dekker, Lambert: *See—*
Boden, Richard M.; Dekker, Lambert; Schmitt, Frederick L.; and Van Loveren, Augustinus G., 4,330,415, Cl. 252-8.600.
Boden, Richard M.; Dekker, Lambert; Schmitt, Frederick L.; and Van Loveren, Augustinus G., 4,330,425, Cl. 252-187.00H.
Delle-Alsthom: *See—*
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de Maight, Winfried; and Schutze, Ronald, to Zahnradfabrik Friedrichshafen, AG. Auxiliary power steering for motor vehicles. 4,329,912, Cl. 91-420.000.
DeMoss, Dean, to Burroughs Corporation. Flying head with foil support. 4,330,804, Cl. 360-102.000.
Dennis, Edmund G.; and Brandmaier, C. Edward, to Cashin Systems Corporation. Bacon slicing machine. 4,329,900, Cl. 83-355.000.
Dennison, Allan G., Jr.; Smith, Stanley B., Jr.; Fonteyn, Robert A.; and Jarratt, Robert V., Jr., to Instrumentation Laboratory Inc. Keyboard type of input control system for an analytical instrument. 4,330,776, Cl. 340-365.00R.
Dentler, Arthur: *See—*
Florin, Gerd; Curtius, Friedrich; and Dentler, Arthur, 4,330,411, Cl. 210-769.000.

Dentsply Research & Development Corp.: *See*—
Dougherty, Emery W.; and Welsh, Richard E., 4,330,280, Cl. 433-90.000.
de Pingon, Pierre J. Multi-use excavating and load handling machine. 4,329,796, Cl. 37-117.500.
Der nee Foldvary, Julia: *See*—
Simonidesz, Vilmos; Papp nee Behr, Agnes; Kovacs, Gabor; Ivanics, Jozsef; Der nee Foldvary, Julia; Stadler, Istvan; and Pallagi, Istvan, 4,330,553, Cl. 424-285.000.
Desai, Jay S., to Becton Dickinson & Co. Elimination of non-microbial turbidity in culture media. 4,330,622, Cl. 435-34.000.
Descamps, Marcel; and Goldenberg, Charles, to Sanofi. N(Sulfonyl-)anilines for treating angina pectoris. 4,330,542, Cl. 424-248.500.
Desplanches, Gerard; and LeClerc, Gerard, to Compagnie Generale d'Electricite. Method of sintering tubular ceramic parts. 4,330,496, Cl. 264-57.000.
Deubner, Joachim; and Zeh, Franz, to Triumph-Werke Nurnberg A.G. Apparatus for monitoring dispensation of glue in an automatic glueing machine. 4,330,354, Cl. 156-352.000.
Deussen, Werner, to Stella KG Werner Deussen. Container closure with childproof lock and original package seal. 4,330,067, Cl. 215-220.000.
Deutsch, Jean-Claude, to Commissariat a l'Energie Atomique. Illuminating device for large screen. 4,330,813, Cl. 362-244.000.
Deutsch, Reinhard: *See*—
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Deutsche Babcock Aktiengesellschaft: *See*—
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Devif, Michel L.: *See*—
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Dey, Arabinda N., to Duracell International Inc. Rechargeable nonaqueous silver alloy anode cell. 4,330,601, Cl. 429-105.000.
de Yampert, H. Donn; and Renteria, Sergio. Cold/hot compression and elevation apparatus. 4,329,997, Cl. 128-402.000.
Diamond Shamrock Corporation: *See*—
Korinek, K. A.; Anderson, R. E.; and Konicek, M. G., 4,330,386, Cl. 204-223.000.
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Di Benedetto, Paolo: *See*—
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Dierassi, David; and Murray, David, to Hoffmann-La Roche Inc. Powdered shampoo concentrate. 4,330,438, Cl. 252-552.000.
Di Fiore, Dante. Home heating system. 4,330,083, Cl. 237-56.000.
Di Giacomo, Peter M.; and Park, Won C., to Occidental Research Corporation. Identification of fluid flow under in-situ mining conditions. 4,330,153, Cl. 299-1.000.
Dijkhuis, Jacob I., to Holec N.V. Magnetic separation method. 4,330,399, Cl. 209-214.000.
Direct Reduction Corporation, The: *See*—
Keran, Vitie P.; and Baker, Alan C., 4,330,325, Cl. 75-36.000.
Disteldorf, Josef; Flakus, Werner; and Schnurbusch, Horst, to Chemische Werke Huls Aktiengesellschaft. Process for the production of storage-stable urethane acryls. 4,330,657, Cl. 528-58.000.
Dobbs, Odis L. Engine shut-down device. 4,329,954, Cl. 123-198.00D.
Dr. Eduard Fresenius, Chemisch-pharmazeutische Industrie KG Apparatebau KG: *See*—
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Dodson, Bill R., to Burroughs Corporation. Recursive system and method for binding compiled routines. 4,330,822, Cl. 364-200.000.
Doerer, Richard P., to Van Dresser Corporation. Automotive liner panel. 4,330,584, Cl. 428-91.000.
Donofrio, Andrew J.; and Gaines, John E., to Otis Elevator Company. Elevator cab load measuring system. 4,330,836, Cl. 364-567.000.
Doori, Hisashi, to Yoshida Kogyo K.K. Apparatus for retaining a slider. 4,329,778, Cl. 29-768.000.
Dorr, Karl H.: *See*—
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Sawada, Yoshihisa; Komatsu, Fumiaki; Sanada, Kazuo; and Sakaki, Yorihisa, 4,330,698, Cl. 219-10.55A.
Doshi, Mahendra F.; Gruber, Martin V.; and Steinlein, Frederick R., to Zurn Industries. Cooling tower water distribution pipe and suspension system therefor. 4,330,491, Cl. 261-111.000.
Dotsko, Martin; and Lakshminarayanasetty, Kadam S., to Singer Company, The. Capacitive sensing device. 4,330,284, Cl. 434-38.000.
Doty, Gerald A., to Gateway Industries, Inc. Tire pressure sensing system. 4,330,774, Cl. 340-58.000.
Doubleday, Ian E., to Burroughs Wellcome Co. Relating to dose determining means of paste dispenser. 4,330,070, Cl. 222-43.000.
Dougherty, Emery W.; and Welsh, Richard E., to Dentsply Research & Development Corp. Ejector holder for capsule-like cartridge. 4,330,280, Cl. 433-90.000.
Douglass, Howard S.; and Fox, Brian G. Fail-safe fiber optic pushbuttons, displays, and systems employing the same. 4,330,174, Cl. 350-96.230.
Dow Chemical Company, The: *See*—
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Cook, Frank T., 4,330,452, Cl. 524-308.000.
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Reynolds, Jack B.; and Amos, Charles R., 4,330,525, Cl. 423-636.000.
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Dowd, Edward J.: *See*—
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Drescher, Wolfgang; and Rittberg, Eilt-Heyo, to Olympia Werke AG. Apparatus for the leakage-free connection of cavities in tubes and vessels. 4,330,010, Cl. 137-614.060.
Dressel, Gary A.: *See*—
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Dresser Industries, Inc.: *See*—
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Drill Services, Inc.: *See*—
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Drummond, Russell F. Food product chiller. 4,329,850, Cl. 62-63.000.
Dubuc, Joseph J., to Honeywell Information Systems Inc. Logic timing system for tape device adapter. 4,330,844, Cl. 364-900.000.
Duckworth, Lawrence L. Thatch loosening rake. 4,330,042, Cl. 172-621.000.
Dudeck, Ingo: *See*—
Grossner, Horst; Dudeck, Ingo; and Maass, Manfred, 4,329,871, Cl. 73-35.000.
Dufournet, Denis: *See*—
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Dunchock, Richard S.; and Alagna, Sam M. Removable roof panel for vehicles. 4,330,150, Cl. 296-218.000.
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Dunlop Limited: *See*—
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Du Pont de Nemours, E. I., and Company: *See*—
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Binnersley, Edwin K., 4,329,750, Cl. 8-151.200.
Cheng, Jiin-Duey, 4,330,674, Cl. 549-11.000.
Cherkofsky, Saul C., 4,330,552, Cl. 424-273.00R.
Fickes, Michael G., 4,330,613, Cl. 430-291.000.
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Dupont, Jean-Marcel: *See*—
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Duracell International Inc.: *See*—
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Duraclean International: *See*—
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Duvdevani, Ilan: *See*—
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Dye, Richard A., to Santa Barbara Research Center. Self-aligning laser communicator utilizing reciprocal tracking. 4,330,204, Cl. 356-152.000.

Dyer, Robert K. Detecting subterranean hydrocarbon accumulations. 4,330,871, Cl. 367-14.000.

Dykast, Jaroslav; Mikulecky, Karel; and Tyl, Miloslav, to Vyzkumny ustav bavlnarsky. Method of and apparatus for starting an open-end spinning machine. 4,329,839, Cl. 57-263.000.

Dynamit Nobel Aktiengesellschaft: *See*—
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Dyno Industrier A.S.: *See*—
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E. J. Brooks Company: *See*—
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E. R. Squibb & Sons, Inc.: *See*—
Ondetti, Miguel A., 4,330,548, Cl. 424-263.000.

East, Anthony J.; Charbonneau, Larry F.; and Calundann, Gordon W., to Celanese Corporation. Poly(ester-amide) capable of forming an anisotropic melt phase derived from 6-hydroxy-2-naphthoic acid, dicarboxylic acid, and aromatic monomer capable of forming an amide linkage. 4,330,457, Cl. 524-602.000.

Easter, William M.: *See*—
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Eastern Electrical Equipment Co., Inc.: *See*—
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Eastman Kodak Company: *See*—
Anagnostopoulos, Constantine N.; Lee, Teh-Hsuang; Burkey, Bruce C.; and Lavine, James P., 4,330,796, Cl. 358-213.000.
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Fleischer, Jean C.; Maner, Ronald J.; and Clark, Gary T., 4,330,467, Cl. 260-155.000.
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Eastman Technology, Inc.: *See*—
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Eaton Corporation: *See*—
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Eaton Stamping Company: *See*—
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Eber, Daniele: *See*—
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Echeverria, Federico S.: *See*—
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Echte, Adolf; Gausepohl, Hermann; Jenne, Helmut; and Mittnacht, Hans, to BASF Aktiengesellschaft. Impact-resistant thermoplastic molding materials with improved stress-cracking resistance. 4,330,641, Cl. 525-310.000.

Eck, Werner; and Hoffmann, Jurgen, to Kraftwerk Union Aktiengesellschaft. Damping device for check valves. 4,330,006, Cl. 137-514.000.

Eckhardt, Wolfgang: *See*—
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Eda, Tadahiro; Tatsumi, Susumu; and Imai, Chikara, to Ricoh Company, Ltd. Electrometer apparatus. 4,330,749, Cl. 324-457.000.

Edmons, Rhonda J.: *See*—
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Edmons, Rhonda Joy: *See*—
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Edsyn, Inc.: *See*—
Dallons, Robert E.; and Fortune, William S., 4,329,989, Cl. 128-218.00R.

Edwards, Gerald D. Tooth construction for digging buckets. 4,329,798, Cl. 37-142.00R.

Eidenschink, Rudolf; Erdmann, Dietrich; Krause, Joachim; and Pohl, Ludwig, to Merck Patent Gesellschaft mit beschrankter Haftung. Cyclohexylbiphenyls, their preparation and use in dielectrics and electrooptical display elements. 4,330,426, Cl. 252-299.630.

Eisenwerk-Gesellschaft Maximilianshutte mbH.: *See*—
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Eistert, Theodor: *See*—
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Ekemar, Carl S. G.: *See*—
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Elber, Wolf, to United States of America, National Aeronautics and Space Administration. Means for controlling aerodynamically induced twist. 4,330,100, Cl. 244-48.000.

Electric Power Research Institute: *See*—
Kazan, Joseph M.; Sharbaugh, John E.; and Ritz, William C., 4,330,370, Cl. 376-200.000.

Electric Power Research Institute, Inc.: *See*—
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Electrostatic Equipment Corp.: *See*—
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Elfe France: *See*—
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Ellis, Edward J.; and Mager, Louis, to Polymer Technology Corporation. Dimensionally stable oxygen permeable hard contact lens material and method of manufacture. 4,330,383, Cl. 204-159.130.

Eloy, Jean-Francois, to COMMISSARIAT a l'Energie Atomique. Process and apparatus for regulating the impact of a light beam on a target. 4,330,208, Cl. 356-318.000.

Embree, Milton L.; and Martin, Earl O., to Bell Telephone Laboratories, Incorporated. Precision converter/isolation circuit. 4,330,744, Cl. 323-316.000.

Emi, Toshihiko: *See*—
Nakanishi, Kyoji; Saito, Kenji; Kato, Yoshiei; Nozaki, Tsutomu; and Emi, Toshihiko, 4,330,108, Cl. 266-47.000.

Ence, Gerald R.; and Ence, Robert D. Fire prevention and cooling system. 4,330,040, Cl. 169-13.000.

Ence, Robert D.: *See*—
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Endo, Fujio: *See*—
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Endo, Masao: *See*—
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England, Eric H., to National Research Development Corporation. Methods of applying circuit elements to a substrate. 4,329,779, Cl. 29-840.000.

Engstrom, Folke, to A. Ahlstrom Osakeyhtio. Fluidized bed reactor. 4,330,502, Cl. 422-142.000.

Enikolopov, Nikolai S.: *See*—
Kostandov, Leonid A.; Enikolopov, Nikolai S.; Dyachkovsky, Fridrikh S.; Novokshonova, Ljudmila A.; Gavrilov, Jury A.; Kudinova, Olga I.; Maklakova, Tatyana A.; Akopian, Leonid A.; Mchedlov-Petrosian, Otar P.; Boilko, Mikhail I.; Staroselsky, Alexandr A.; and Tkachenko, Vladimir P., 4,330,573, Cl. 427-213.000.

Enzyme Center, Inc., The: *See*—
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Epitogepgyarto Vallalat: *See*—
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Equalizer, Inc.: *See*—
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Erich Schultze KG. Alt-Heiligensee 44: *See*—
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Erickson, Keith D. Food dryer. 4,329,789, Cl. 34-195.000.

Erkkila, John H.: *See*—
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Ervin Industries, Inc.: *See*—
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Escher Wyss Limited: *See*—
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Eslinger, Ralph G., to Bendix Corporation, The. Rotary compressor with communication between chambers to provide supercharging. 4,330,240, Cl. 418-1.000.

Esposito, John J.: *See*—
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Etablissement Dentaire Ivoclar: *See*—
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Esterowitz, Leon; and Kruer, Melvin R., to United States of America, Navy. Resonantly pumped mid-ir laser. 4,330,763, Cl. 372-41.000.

Estes, Michael S.: *See*—
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Estes, Robert F.: *See*—
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Etablissements Georges Lucas: *See*—
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Etablissements Nativelle S.A.: *See—*
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Etat Francais represente par le Delegue General pour l'Armement: *See—*
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Eto, Kunihiko; Seki, Shiro; and Owa, Kaoru, to Toyoda Koki Kabushiki Kaisha. Contact detecting apparatus. 4,329,771, Cl. 29-568.000.
Etudes Petrolieres Marines: *See—*
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Everett, Jack E.: *See—*
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Evreka, Inc.: *See—*
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Exxon Research & Engineering Co.: *See—*
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Lundberg, Robert D.; Phillips, Robert R.; and Duvdevani, Ilan, 4,330,447, Cl. 524-269.000.
Patton, Tad L., 4,330,453, Cl. 524-294.000.
Taylor, William F., 4,330,302, Cl. 44-63.000.
Wristers, Harry J., deceased, 4,330,433, Cl. 252-429.00B.
Eyrard, Pierre; and Poquet, Jean-Paul, to Curty, Societe Anonyme. Cylinder-head gasket and method of making same. 4,330,585, Cl. 428-131.000.
Ezzell, Bobby R.; Carl, William P.; and Mod, William A., to Dow Chemical Company, The. Novel polymers having acid functionality. 4,330,654, Cl. 526-243.000.
Fabry, Istvan: *See—*
Pietschmann, Frank; John, Gunter; Eistert, Theodor; Noack, Christian; Oliva, Klaus; Zumpe, Bernd; Spaida, Hans P.; Boltizar, Pal; Fabry, Istvan; Vida, Csongor; Lakos, Lajos; and Klement, Matjas, 4,329,832, Cl. 56-98.000.
Fair, Walter B., Jr.: *See—*
Richardson, Edwin A.; and Fair, Walter B., Jr., 4,330,037, Cl. 166-250.000.
Fairchild Camera and Instrument Corporation: *See—*
Griffith, Paul J., 4,330,723, Cl. 307-456.000.
Falconbridge Nickel Mines Limited: *See—*
Parkinson, Ronald; and Howard, Robert W., 4,330,380, Cl. 204-123.000.
Falzoni, Gianluigi, to Fiat Auto S.p.A. Drive transmission unit incorporating expansible-pulley stepless speed changer. 4,329,888, Cl. 74-689.000.
Fapiano, Donald J., to General Electric Company. Method of controlling a reheat furnace to control skid mark effects. 4,330,263, Cl. 432-11.000.
Farmer, D. Eugene. Methane monitor sensing system. 4,329,870, Cl. 73-23.000.
Farrow, Michael M., to United States of America, Navy. Laser/ultrasonic welding technique. 4,330,699, Cl. 219-121.0LD.
Fassbinder, Hans-Georg: *See—*
Brotzmann, Karl; and Fassbinder, Hans-Georg, 4,330,326, Cl. 75-60.000.
Fattore, James T., Jr.; Fattore, Robert L.; Angevine, William R.; and Spence, John R., to Photo-tronics, Inc. Camera-operating device. 4,330,184, Cl. 354-81.000.
Fattore, Robert L.: *See—*
Fattore, James T., Jr.; Fattore, Robert L.; Angevine, William R.; and Spence, John R., 4,330,184, Cl. 354-81.000.
Faugeras, Olivier: *See—*
Pratt, William K.; Abramatic, Jean-Francois; and Faugeras, Olivier, 4,330,833, Cl. 364-515.000.
Fayette Tubular Products: *See—*
Paini, William R., 4,330,142, Cl. 285-256.000.
Fennemann, Wolfgang; and Haldorn, Jurgen, to Metallgesellschaft Aktiengesellschaft. Process for regenerating spent pickle liquid containing ZrF_4. 4,330,342, Cl. 134-13.000.
Ferdinand, Irwin J.; Sylvan, Richard; and Peterson, Michael, to Hirsh Company. Vise. 4,330,113, Cl. 269-88.000.
Ferrari, Harry. Racquets. 4,330,132, Cl. 273-73.00D.
Ferri, Johann W.: *See—*
Gasser, Hermann; Di Benedetto, Paolo; and Ferri, Johann W., 4,329,840, Cl. 57-279.000.
Ferriss, Lincoln S., to Singer Company, The. Signal processor for a resonator restrained gyro. 4,329,884, Cl. 74-5.60D.
Ferstenberg, Frederik. Device for setting precious stones. 4,329,890, Cl. 81-7.000.
Fiat Auto S.p.A.: *See—*
Burgio, Antonio, 4,329,956, Cl. 123-286.000.
Falzoni, Gianluigi, 4,329,888, Cl. 74-689.000.
Fiber Industries, Inc.: *See—*
Blackmon, Lawrence E.; Dees, John R.; and Mowe, Wayne T., 4,330,591, Cl. 428-369.000.
Fickes, Michael G., to Du Pont de Nemours, E. I., and Company. Process for toning tacky image surfaces with dry nonelectroscopic toners. 4,330,613, Cl. 430-291.000.
Fieux, Robert E. Means and method of restoring documents, paintings and the like. 4,330,586, Cl. 428-196.000.
Finike Italiana Marposs, S.p.A.: *See—*
Possati, Mario; Golinelli, Guido; and Selleri, Narciso, 4,329,782, Cl. 33-147.00K.
Fink, Roland, to Oskar Frach Werkzeugbau GmbH & Co. KG. Method and device for controlling injection process in cold-chamber die-casting machines. 4,330,026, Cl. 164-457.000.
Finkbeiner, Werner, to Hans Grohe GmbH & Co. KG. Adjustable massage shower head. 4,330,089, Cl. 239-383.000.
Finkelstein, Alberto L., to Mollura Industries. Double pancake waterbed mattress. 4,329,748, Cl. 5-451.000.
First National Bank and Trust Company, by, executor: *See—*
Siekmeier, David A.; Andersen, Glen L.; Zimmerer, Arthur L., deceased; First National Bank and Trust Company, by, executor; and Zimmerer, William P., 4,330,085, Cl. 239-1.000.
Fischer, Johann P.: *See—*
Becker, Udo; Busch, Wolfram; Fischer, Johann P.; and Sommer, Werner, 4,329,992, Cl. 128-272.000.
Fischer, Johanna: *See—*
Zirngibl, Ludwig; Fischer, Johanna; and Thiele, Kurt, 4,330,545, Cl. 424-263.000.
Fischer, Karl; Kicherer, Robert; and Mayer, Hans, to Fischer, Karl. Arrangement for mounting a sensing box in an opening in an electric hot plate. 4,330,701, Cl. 219-450.000.
Fischer & Porter Co.: *See—*
Appel, Eggert; Kiene, Wilfried; and Meier, Dieter, 4,329,879, Cl. 73-861.120.
Herzl, Peter J., 4,329,880, Cl. 73-861.240.
Fischer, Richard J., to Gates Rubber Company, The. Ribbed power transmission belt. 4,330,287, Cl. 474-238.000.
Fischer, William C.; and Adams, Don L., to United Technologies Corporation. Helicopter flight stability control induced oscillation suppression. 4,330,829, Cl. 364-434.000.
Fisher, Sidney E.; and Hunt, Keith R., to Britax Weathershields Limited. Ventilators and/or windows for vehicles. 4,329,917, Cl. 98-2.140.
Fister, Julius C.: *See—*
Winter, Joseph; Brenneman, William; and Fister, Julius C., 4,330,599, Cl. 428-675.000.
Flakus, Werner: *See—*
Disteldorf, Josef; Flakus, Werner; and Schnurbusch, Horst, 4,330,657, Cl. 528-58.000.
Fleischer, Jean C.; Maner, Ronald J.; and Clark, Gary T., to Eastman Kodak Company. Disubstituted isothiazole azo dyes containing tetrahydroquinoline type couplers. 4,330,467, Cl. 260-155.000.
Fletcher, Thomas S. Guide device for endotracheal tubes. 4,329,983, Cl. 128-207.140.
Flinchum, Charles: *See—*
Pierson, Marvin B.; and Flinchum, Charles, 4,330,574, Cl. 427-319.000.
Flogaus, William S.; and Blecha, Bill A. Fastener for joining a structural member to masonry or concrete. 4,329,826, Cl. 52-712.000.
Flor, James E.: *See—*
Tejera, Enrique; Currie, Sara A.; Flor, James E.; and Monaghan, Richard L., 4,330,624, Cl. 435-75.000.
Florin, Gerd; Curtius, Friedrich; and Dentler, Arthur, to Escher Wyss Limited. Process for treating clarified sludge. 4,330,411, Cl. 210-769.000.
Flynn, Richard M.: *See—*
Burton, Donald J.; and Flynn, Richard M., 4,330,486, Cl. 260-502.40P.
FMC Corporation: *See—*
Billett, Ronald J.; Anderson, David N.; and Easter, William M., 4,330,245, Cl. 425-126.00S.
Scudder, Roy, 4,329,836, Cl. 56-330.000.
Wilson, Donald C., 4,330,413, Cl. 210-806.000.
Foch, Henri; and Roux, Jacques, to Agence Nationale de Valorisation de la Recherche. Static semi conductor electrical energy converter. 4,330,819, Cl. 363-132.000.
Focke, Heinz, to Focke & Pfuhl. Method of producing wrapping for cigarettes. 4,330,290, Cl. 493-372.000.
Focke & Pfuhl: *See—*
Focke, Heinz, 4,330,290, Cl. 493-372.000.
Foerster, Hubert; and Sochor, Josef, to Robert Bosch GmbH. Method of recording television signals. 4,330,795, Cl. 358-127.000.
Fohl, Artur, to Repa Feinstanzwerk GmbH. Hinge construction. 4,329,758, Cl. 16-273.000.
Folschweiler, Serge L. Apparatus for forming moulded articles from a blank sheet. 4,330,247, Cl. 425-174.80E.
Fonteyn, Robert A.: *See—*
Dennison, Allan G., Jr.; Smith, Stanley B., Jr.; Fonteyn, Robert A.; and Jarratt, Robert V., Jr., 4,330,776, Cl. 340-365.00R.
Ford Motor Company: *See—*
Abts, Manfred; and Urban, Dieter, 4,329,949, Cl. 123-90.340.
Gesenhaus, Reinhard, 4,330,053, Cl. 192-4.00C.
Foreman, Thomas V., Sr. Telephone attachment for supporting a book or the like above the telephone. 4,330,692, Cl. 179-178.000.
Forrest, William J. Cargo loading apparatus. 4,329,752, Cl. 14-69.500.
Fortune, William S.: *See—*
Dallons, Robert E.; and Fortune, William S., 4,329,989, Cl. 128-218.00R.
Foseco Trading A.G.: *See—*
Lynham, C. Richard, 4,330,107, Cl. 266-44.000.

Foulkes, John D.; Worthington, David K.; and Trombly, John E., to Teltone Corporation. Audio and full duplex digital data carrier system. 4,330,687, Cl. 179-2.0DP.

Fox, Brian G.: *See*—
Douglass, Howard S.; and Fox, Brian G., 4,330,174, Cl. 350-96.230.

Foxboro Co., The: *See*—
Olsen, Everett O.; LaCroix, James R.; and Bowditch, Hoel L., 4,329,775, Cl. 29-602.00A.
Olsen, Everett O.; Estes, Robert F.; Rezendes, Paul W.; and Williams, George F., 4,329,910, Cl. 91-375.00R.

Frac-Well, Inc.: *See*—
Hane, Paul C.; and Moore, Harold D., 4,329,925, Cl. 102-310.000.

Francis, Marion D., to Procter & Gamble Company, The. Compositions for inhibiting mobilization of calcium phosphate in animal tissue. 4,330,537, Cl. 424-204.000.

Franco, Luigi: *See*—
Ruspa, Giacomo; and Franco, Luigi, 4,330,047, Cl. 181-224.000.

Frank, Arthur M., to Grumman Aerospace Corporation. Solar heating system. 4,329,979, Cl. 126-422.000.

Franks, John A., Jr., to Vulcan Materials Company. Electrolytic process for the production of tin and tin products. 4,330,377, Cl. 204-93.000.

Fransen, Lawrence J.: *See*—
Kang, George S.; Fransen, Lawrence J.; and Kline, Evans L., 4,330,689, Cl. 179-15.55R.

Fraunhofer Gesellschaft zur Forderung der angewandten Forschung e.v.: *See*—
Goetzberger, Adolf, 4,330,680, Cl. 136-247.000.

Frederick, Stanley H., to International Telephone and Telegraph Corporation. Hydrotherapy device, method and apparatus. 4,330,412, Cl. 210-805.000.

Freedman, Morris D.: *See*—
Whiteside, Arliss E.; and Freedman, Morris D., 4,330,826, Cl. 364-200.000.

Freeman, Leslie C. Plant shipping and display container. 4,330,059, Cl. 206-423.000.

Frey, Bernhard, to Jydrpwatt Systems Limited. Cylinder-piston combination particularly for high-pressure application. 4,329,914, Cl. 92-105.000.

Freyssinet International (STUP): *See*—
Legrand, Pierre; and Guinard, Pierre, 4,330,243, Cl. 425-111.000.

Friebe, Walter-Gunar; Winter, Werner; Thiel, Max; Roesch, Androniki; and Wilhelms, Otto-Henning, to Boehringer Mannheim GmbH. Coumarins connected via an oxyalkyl group with a piperidine ring having anti-allergic action. 4,330,549, Cl. 424-267.000.

Friedman, Bernard. Fryer oil treatment composition and method. 4,330,564, Cl. 426-417.000.

Friedman, Joshua; and Zetena, Maurice F., Jr. Lighting system for a dental handpiece. 4,330,274, Cl. 433-29.000.

Frohberger, Paul-Ernst: *See*—
Kraatz, Udo; Buchel, Karl H.; Stetter, Jorg; Frohberger, Paul-Ernst; and Brandes, Wilhelm, 4,330,547, Cl. 424-263.000.

Fruhbeis, Horst: *See*—
Martini, Thomas; Erckel, Rudiger; Fruhbeis, Horst; Rosch, Gunter; and Probst, Heinz, 4,330,427, Cl. 252-301.240.

Fuchs, Hubert. Apparatus for purifying polluted liquids. 4,330,403, Cl. 210-221.200.

Fuji Jukogyo Kabushiki Kaisha: *See*—
Sogo, Hiroshi; and Yoshino, Nobuo, 4,330,099, Cl. 244-3.130.

Fuji Photo Film Co., Ltd.: *See*—
Minamizono, Junji; Kishimoto, Shinzo; and Inayama, Takayuki, 4,330,618, Cl. 430-528.000.

Fujibayashi, Kazuo; and Momiyama, Kikuo, to Canon Kabushiki Kaisha. Focusing screen. 4,330,188, Cl. 354-200.000.

Fujii, Setsuro: *See*—
Arima, Teruo; Machii, Kenji; Chikazawa, Nobumoto; Takeuchi, Tetsuya; and Fujii, Setsuro, 4,330,527, Cl. 424-94.000.

Fujii, Tomoo: *See*—
Nakayama, Shozo; Kato, Kimio; Mukai, Takamitu; Fujii, Tomoo; and Kono, Hiroya, 4,329,913, Cl. 92-71.000.

Fujii, Yohji; and Minowa, Junichiro, to Nippon Telegraph & Telephone Public Corporation. Blazed diffraction grating structures and method of manufacturing the same. 4,330,175, Cl. 350-162.00R.

Fujikawa, Tetsuzo; Seto, Yasuhiro; Yamamoto, Masaru; and Tanaka, Ichiro, to Kawasaki Jukogyo Kabushiki Kaisha. Multiple port cylinder for crankchamber precompression type two stroke engines. 4,329,948, Cl. 123-73.0AA.

Fujioka, Yoshiki: *See*—
Kohzai, Yoshinori; Kawada, Shigeki; and Fujioka, Yoshiki, 4,330,832, Cl. 364-474.000.

Fujisawa Pharmaceutical Co., Ltd.: *See*—
Imanaka, Hiroshi; and Nishida, Minoru, 4,330,529, Cl. 424-114.000.

Fujita, Masahiro, to Tokyo Shibaura Denki Kabushiki Kaisha. Channel selection data memory device. 4,330,867, Cl. 455-186.000.

Fujitsu Fanuc Limited: *See*—
Imazeki, Ryoji; Hattori, Masayuki; and Nakamura, Shigeo, 4,330,816, Cl. 363-56.000.
Kohzai, Yoshinori; Kawada, Shigeki; and Fujioka, Yoshiki, 4,330,832, Cl. 364-474.000.

Fujitsu Limited: *See*—
Kashiwabara, Hirotaka; Shirai, Mamoru; and Inoue, Shinichi, 4,330,770, Cl. 335-112.000.
Togei, Ryoiku; and Hika, Yoshihiko, 4,330,849, Cl. 365-181.000.

Fujiwara, Koichi; Yamauchi, Goro; Arita, Kishio; and Tsurumi, Shigeyuki, to Nippon Telegraph and Telephone Public Corporation. Electric contact material and method of producing the same. 4,330,331, Cl. 148-2.000.

Fukaya, Hirokazu; and Togari, Hisashi, to Nippon Electric Co., Ltd. Semiconductor power amplification circuit. 4,330,757, Cl. 330-298.000.

Fukuda, Takeo; Hanawa, Kazuhiko; and Urui, Kiyoshi, to Tokyo Shibaura Electric Co., Ltd. Automatic telephone exchange system for both speech signals and data transfer. 4,330,886, Cl. 370-62.000.

Fukui, Kiyozumi, to Teijin Seiki Company Limited. Drive controlling mechanism. 4,330,051, Cl. 192-3.00N.

Fukukita, Hiroshi: *See*—
Tachita, Ryobun; and Fukukita, Hiroshi, 4,330,875, Cl. 367-105.000.

Fukushima, Shizunobu: *See*—
Iwata, Akira; and Fukushima, Shizunobu, 4,330,494, Cl. 264-46.200.

Fukushima, Yukihiro: *See*—
Obata, Shuichi; Yasuda, Hiroshi; and Fukushima, Yukihiro, 4,330,884, Cl. 369-255.000.

Fumakilla Limited: *See*—
Takei, Yasuharu, 4,330,506, Cl. 422-305.000.

Fuminier, Claude; and Pierrel, Michel, to Pont-A-Mousson S.A. Ductile cast iron pipe having constricted end casing. 4,330,015, Cl. 138-109.000.

Furusato, Masayasu: *See*—
Sakurai, Hisaya; Katayama, Yoshihiko; Ikegami, Tadashi; and Furusato, Masayasu, 4,330,646, Cl. 526-116.000.
Sakurai, Hisaya; Katayama, Yoshihiko; Ikegami, Tadashi; and Furusato, Masayasu, 4,330,647, Cl. 526-116.000.
Sakurai, Hisaya; Katayama, Yoshihiko; Ikegami, Tadashi; and Furusato, Masayasu, 4,330,651, Cl. 526-127.000.

Futures Group, Inc., The: *See*—
Gordon, Theodore J., 4,330,691, Cl. 179-146.00E.

Fyles, Kenneth M.: *See*—
Cockram, David R.; and Fyles, Kenneth M., 4,330,628, Cl. 501-38.000.

Gaines, John E.: *See*—
Donofrio, Andrew J.; and Gaines, John E., 4,330,836, Cl. 364-567.000.

Gaiser, Robert F., to Bendix Corporation, The. Fast fill displacement master cylinder. 4,329,846, Cl. 60-562.000.

Gale, George M., to Rubber & Plastics Research Assoc of GB. Mixing device. 4,330,215, Cl. 366-99.000.

Gallagher, Roger W., to Reliance Truck Company. Crane type lifting assembly for heavy loads. 4,330,105, Cl. 254-89.00R.

Gama, Jose M. Articulator for models of dental arches. 4,330,275, Cl. 433-57.000.

Gambino, Richard J.; and Taylor, Robert C., to International Business Machines Corporation. Charged wall amorphous magnetic layers. 4,330,848, Cl. 365-32.000.

Gannaway, Edwin L., to Tecumseh Products Company. Compressor muffler. 4,330,239, Cl. 417-312.000.

Ganzel, Larry A.: *See*—
Nelson, Theodore W., Jr.; Corkle, David B.; Wolfe, Joel Z.; and Ganzel, Larry A., 4,330,511, Cl. 423-210.000.

Gardiol, Maurice: *See*—
Jeanvoine, Pierre L.; and Gardiol, Maurice, 4,330,630, Cl. 501-105.000.

Garin, Arlette; Rouger, Michel; and Saudinos, Jean, to Commissariat a l'Energie Atomique. Particle detector. 4,330,731, Cl. 313-104.000.

Garven, David H.: *See*—
Berner, John M., 4,329,792, Cl. 37-43.00D.

Gasser, Hermann; Di Benedetto, Paolo; and Ferri, Johann W., to Luwa AG. Method of and apparatus for feeding a fibre tow to a textile machine. 4,329,840, Cl. 57-279.000.

Gastebois, Philippe M. D.: *See*—
Caruel, Jacques E. J.; Gastebois, Philippe M. D.; and Coutor, Simone, 4,329,848, Cl. 60-757.000.

Gates Rubber Company, The: *See*—
Fischer, Richard J., 4,330,287, Cl. 474-238.000.

Gateway Industries, Inc.: *See*—
Doty, Gerald A., 4,330,774, Cl. 340-58.000.

Gati, Sandor; and Holzle, Gerd, to Ciba-Geigy Corporation. Reactive dyes, processes for their manufacture and their use. 4,330,469, Cl. 260-242.200.

Gaul, John H., Jr.; and Drago, Russell S., to University of Illinois Foundation. Polymer bound multidentate complexes. 4,330,642, Cl. 525-337.000.

Gausepohl, Hermann: *See*—
Echte, Adolf; Gausepohl, Hermann; Jenne, Helmut; and Mittnacht, Hans, 4,330,641, Cl. 525-310.000.

Gausmann, Hans; and Geis, Walter, to Carl Zeiss-Stiftung. Cuvette for use in optical measurements. 4,330,206, Cl. 356-246.000.

Gavrielides, Athanasios: *See*—
Peterson, Phillip R.; Gavrielides, Athanasios; and Erkkila, John H., 4,330,211, Cl. 356-354.000.

Gavrilov, Jury A.: *See*—
Kostandov, Leonid A.; Enikolopov, Nikolai S.; Dyachkovsky, Fridrikh S.; Novokshonova, Ljudmila A.; Gavrilov, Jury A.; Kudinova, Olga I.; Maklakova, Tatyana A.; Akopian, Leonid A.; Mchedlov-Petrosian, Otar P.; Boilko, Mikhail I.; Staroselsky, Alexandr A.; and Tkachenko, Vladimir P., 4,330,573, Cl. 427-213.000.

Gebhardt, James L.; and Hutchins, Ferris L., Jr., to Mead Corporation, The. Merchandising display. 4,330,102, Cl. 248-459.000.

Gehm, Ulrich, to U.S. Philips Corporation. Method and apparatus for determining the internal dimension of hollow bodies. 4,330,835, Cl. 364-560.000.

Gehri, Hermann: *See*—
Raye, Pierre; Jaquiery, Henri; and Gehri, Hermann, 4,330,227, Cl. 407-36.000.
Geipel, Henry J., Jr.; and Shasteen, Richard B., to International Business Machines Corp. Method of making low leakage shallow junction IGFET devices. 4,329,773, Cl. 29-571.000.
Geis, Walter: *See*—
Gausmann, Hans; and Geis, Walter, 4,330,206, Cl. 356-246.000.
Gellert, Jobst U. Injection molding mechanical double acting valve pin actuator. 4,330,258, Cl. 425-564.000.
General Atomic Company: *See*—
Anderson, Paul M., 4,330,369, Cl. 376-268.000.
Ohyabu, Nobuyoshi, 4,330,864, Cl. 376-133.000.
O'Keefe, Dennis R.; McCorkle, Kenneth H., Jr.; and de Graaf, Johannes D., 4,330,374, Cl. 203-12.000.
General Electric Company: *See*—
Albright, Donald R.; Sage, Henry F.; and Archibald, James B., 4,330,726, Cl. 310-254.000.
Baldwin, Samuel L.; and Hogue, Marcus P., 4,330,814, Cl. 362-267.000.
Brunelle, Daniel J., 4,330,664, Cl. 528-198.000.
Byrne, Michael, 4,330,729, Cl. 310-322.000.
Cheng, Chung-Kae C., 4,330,702, Cl. 219-492.000.
Fapiano, Donald J., 4,330,263, Cl. 432-11.000.
Kirkpatrick, Robert G.; Snyder, Ronald R.; and Sibley, Lincoln L., Jr., 4,329,907, Cl. 89-12.000.
McMillan, Stephen L., 4,330,081, Cl. 236-12.00R.
Poling, Ronald W., 4,330,695, Cl. 200-83.00P.
Roberts, Gerald L., 4,329,859, Cl. 68-23.00R.
Rosenquist, Niles R., 4,330,663, Cl. 528-176.000.
Sawada, Fred H.; Barton, Sterling C.; Echeverria, Federico S.; and Carson, Chester C., 4,330,808, Cl. 361-25.000.
White, Dwain M.; and Keyes, David G., 4,330,666, Cl. 528-207.000.
General Motors Corporation: *See*—
Johnston, Laird E., 4,329,961, Cl. 123-502.000.
Johnston, Laird E., 4,329,962, Cl. 123-502.000.
Longhouse, Richard E., 4,329,946, Cl. 123-41.490.
Mowery, Kenneth D., 4,329,970, Cl. 123-618.000.
Shadman, Farhang; and Hegedus, Louis, 4,329,844, Cl. 60-311.000.
Wich, Thomas J., 4,329,958, Cl. 123-387.000.
Gent, John T.: *See*—
Litchfield, William B.; Gent, John T.; and Graham, James A. S., 4,330,575, Cl. 427-376.300.
Geo Vann, Inc.: *See*—
Vann, Roy R.; Ribble, George W.; and George, Flint R., 4,330,039, Cl. 166-297.000.
George, Flint R.: *See*—
Vann, Roy R.; Ribble, George W.; and George, Flint R., 4,330,039, Cl. 166-297.000.
George, Mark S.; and Stucke, Arthur W., to Hobart Corporation. Variable force inertial arm winding control system. 4,330,097, Cl. 242-187.000.
George Weston Limited: *See*—
Lawford, George R.; and Lewis, Peter N., 4,330,464, Cl. 260-112.00R.
Gerling, John E.: *See*—
Pomeroy, James F.; Colato, Albert E.; Danley, Allen M.; and Gerling, John E., 4,330,696, Cl. 219-10.55F.
Gesenhaus, Reinhard, to Ford Motor Company. Meshing device for an after-running transmission shaft. 4,330,053, Cl. 192-4.00C.
Giallorenzi, Thomas G.: *See*—
Huang, Peter H. C.; Weller, Joseph F.; and Giallorenzi, Thomas G., 4,330,768, Cl. 333-153.000.
Giannuzzi, Louis N. Anchor bolt assembly. 4,330,230, Cl. 411-55.000.
Gibbs, Norman R., to Valeron Corporation, The. High titanium nitride cutting material. 4,330,333, Cl. 75-244.000.
Gilbert, Ronald E.; and Kochhar, Rajindar K., to Gulf Oil Corporation. Process for polymerizing propylene with an improved titanium chloride catalyst. 4,330,652, Cl. 526-138.000.
Gillette Donald J., to Electrostatic Equipment Corp. Method and apparatus for electrostatic coating with controlled particle cloud. 4,330,567, Cl. 427-32.000.
Girard, Paul, to Compagnie Internationale Pour l'Informatique Cii Honeywell Bull (Societe Anonyme). Device for automatic control of the storage capacity put to work in data processing systems. 4,330,825, Cl. 364-200.000.
Girard, Paul M., to Compagnie Internationale pour l'Informatique Cii Honeywell Bull (Societe Anonyme). Universal arrangement for the exchange of data between the memories and the processing devices of a computer. 4,330,824, Cl. 364-200.000.
Giuliani, John F.; and Auerbach, Abe, to United States of America, Navy. Selective photoinduced condensation technique for producing semiconducting compounds. 4,330,570, Cl. 427-54.100.
Giustiniani, Piercarlo; and Vincentini, Franco, to Selenia Industrie Elettroniche Associate S.p.A. Radar indicators with digital processing of video signal. 4,330,781, Cl. 343-5.0DP.
GKN Stenman AB: *See*—
Tranberg, Erik R.; and Widen, Bo G., 4,329,768, Cl. 29-417.000.
Glasgow, James S., to Santa Fe International Corporation. System for entrenching submerged elongated structures. 4,330,225, Cl. 405-160.000.
Glass, Donald R.; and McCoid, Geraldine L. Method and apparatus for facilitating dental hygiene. 4,330,014, Cl. 132-89.000.
Glatthorn, Raymond H., to Westinghouse Electric Corp. Apparatus for working on tubesheets. 4,329,769, Cl. 29-568.000.
Glennon, Timothy F., to Sundstrand Corporation. Electrical aircraft engine start and generating system. 4,330,743, Cl. 322-10.000.
Glineur, Willy, to Solvay & Cie. Process for the manufacture of aqueous solutions of alkali metal hypochlorite. 4,330,521, Cl. 423-473.000.
Glinsmann, Gibert R.; and Hedges, James H., to Phillips Petroleum Company. Characterizing hydrocarbon sulfonates and utilization of hydrocarbon sulfonates in oil recovery. 4,330,418, Cl. 252-8.55D.
Gloth, Richard E.: *See*—
Keck, Max H.; Gloth, Richard E.; and Tazuma, James J., 4,330,462, Cl. 524-331.000.
Glynn, Thomas J. Ventilating entry-proof window. 4,330,020, Cl. 160-90.000.
Go, Santos W., to Owens-Illinois, Inc. Copolyesters, method of making same and packaging materials. 4,330,661, Cl. 528-173.000.
Goddijn, Bernardus H. A., to U.S. Philips Corporation. Stepping motor. 4,330,724, Cl. 310-49.00R.
Godfrey, Marl D.: *See*—
Miller, Bradley W.; Hickenlooper, Franklin T.; Uhlrich, David C.; Godfrey, Marl D.; Clifford, Douglas M.; James, Rex L.; Watson, Robert E.; Keith, John C.; and Mortensen, Allen C., 4,330,839, Cl. 364-706.000.
Goetzberger, Adolf, to Fraunhofer Gesellschaft zur Forderung der angewandten Forschung e.v. Integrated series-connected solar cell. 4,330,680, Cl. 136-247.000.
Gohda, Kenichi: *See*—
Watanabe, Hiroshi; Mikata, Tsuruo; and Gohda, Kenichi, 4,330,526, Cl. 424-70.000.
Goldberg, Michel: *See*—
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Goldenberg, Charles: *See*—
Descamps, Marcel; and Goldenberg, Charles, 4,330,542, Cl. 424-248.500.
Goldsmith, Hugh A.: *See*—
Hyde, Eric A.; Goldsmith, Hugh A.; and Proudlove, Michael J., 4,330,865, Cl. 376-249.000.
Goldstein, Jack, to New York Blood Center, Inc. Enzymatic conversion of red cells for transfusion. 4,330,619, Cl. 435-2.000.
Golinelli, Guido: *See*—
Possati, Mario; Golinelli, Guido; and Selleri, Narciso, 4,329,782, Cl. 33-147.00K.
Goodyear Tire & Rubber Company, The: *See*—
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Keck, Max H.; Gloth, Richard E.; and Tazuma, James J., 4,330,462, Cl. 524-331.000.
Kimball, Michael E., 4,330,454, Cl. 524-773.000.
Gordon, Theodore J., to Futures Group, Inc., The. Integral ceiling tile-loudspeaker system. 4,330,691, Cl. 179-146.00E.
Gorin, Everett: *See*—
Lancet, Michael S.; Curran, George P.; and Gorin, Everett, 4,330,430, Cl. 252-420.000.
Gorman, Jeremy W. Fuel additive. 4,330,304, Cl. 44-63.000.
Gorman, Joseph G.: *See*—
Kemeny, George A.; and Gorman, Joseph G., 4,329,971, Cl. 124-3.000.
Gorny, Bernard S. J. M.; Brun, Jean-Paul; Boutemy, Gerard E. M.; and Devif, Michel L., to PCUK Produits Chimiques Ugine Kuhlmann. Dichloroacetamide and trichloroacetamide derivatives which are antidotes against herbicides. 4,330,323, Cl. 71-100.000.
Goto, Naohiro: *See*—
Shidara, Keiichi; Goto, Naohiro; Kawamura, Tatsuro; Hiruma, Eikyu; Ikeda, Yohitsumu; Tanioka, Kenkichi; Hirai, Tadaaki; Takasaki, Yukio; Kusano, Chushirou; Uda, Tsuyoshi; and Nonaka, Yasuhiko, 4,330,733, Cl. 313-386.000.
Gould Inc.: *See*—
Moore, Chad Z., 4,330,720, Cl. 307-270.000.
Grabmaier, Christa; Otto, Franz; and Thomann, Helmut, to Siemens Aktiengesellschaft. Method of producing plate- or tape-shaped silicon crystal bodies having crystalline pillar-like structures therein, equivalent to crystalline columnar structures, for large surface solar cells. 4,330,358, Cl. 156-603.000.
Grabmaier, Christa; and Haussuehl, Siegfried, to Siemens Aktiengesellschaft. Crystalline $Bi_2Ge_3O_9$ and its preparation. 4,330,524, Cl. 423-593.000.
Graham, James A. S.: *See*—
Litchfield, William B.; Gent, John T.; and Graham, James A. S., 4,330,575, Cl. 427-376.300.
Graham, Roy R., to PPG Industries, Inc. Glass fibers with improved dispersibility in aqueous solutions and sizing composition and process for making same. 4,330,337, Cl. 106-135.000.
Granger, Charles C. Air-fuel charge heater and humidifier. 4,329,963, Cl. 123-552.000.
Graser, Earl J., to Manville Service Corporation. Abbreviated height partition. 4,330,078, Cl. 229-15.000.
Graube, Andrejs: *See*—
Wreede, John E.; Graube, Andrejs; and Mulvihill, Mark A., 4,330,604, Cl. 430-2.000.
Greenville Steel Car: *See*—
Minshull, Thomas R., 4,329,927, Cl. 105-462.000.
Greenwood, Leon D., to Eaton Stamping Company. Cushioned starter pinion. 4,330,713, Cl. 290-48.000.
Gregory, Brian, to BICC Limited. Fluid-filled electric cable joints and terminations with filtering means. 4,330,681, Cl. 174-14.00R.
Grendelman, Mannes, to Wavin B.V. Pipe part provided with a flange. 4,330,016, Cl. 138-109.000.

Grenier, Maurice; and Petit, Pierre, to L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude. Plate-type heat exchangers. 4,330,308, Cl. 62-40.000.

Griffith, Paul J., to Fairchild Camera and Instrument Corporation. Transistor logic output device for diversion of Miller current. 4,330,723, Cl. 307-456.000.

Griffiths, Evan, to Orion Machinery and Engineering Corporation. Method and apparatus for drawing and cooling wire. 4,329,861, Cl. 72-14.000.

Grimes, Whiteford; and Lombardi, Ronald A., to Stauffer Chemical Company. Method of forming a metallized decorative film laminate. 4,330,352, Cl. 156-235.000.

Griner, Paul K.: *See—*
Swisher, Scott N.; Barnett, Richard E.; and Griner, Paul K., 4,330,758, Cl. 331-1.00A.

Grogler, Gerhard; and Kallert, Wilhelm, to Bayer Aktiengesellschaft. Activated isocyanate prepolymers and a process for the production of elastomeric polyurethane resins. 4,330,656, Cl. 528-52.000.

Grollimund, Everett C.; and Spiers, Steven F., to Philip Morris, Incorporated. Web marking apparatus and method. 4,330,356, Cl. 156-446.000.

Grossner, Horst; Dudeck, Ingo; and Maass, Manfred, to Daimler-Benz Aktiengesellschaft. Undesirable combustion characteristic detection apparatus. 4,329,871, Cl. 73-35.000.

Gruber, Martin V.: *See—*
Doshi, Mahendra F.; Gruber, Martin V.; and Steinlein, Frederick R., 4,330,491, Cl. 261-111.000.

Gruber, Wolfgang; Lenz, Helmut; Looser, Siegfried; and Linke, Hans-Ralf, to Boehringer Mannheim GmbH. Method and reagent for the determination of creatine kinase MB. 4,330,620, Cl. 435-7.000.

Grumman Aerospace Corporation: *See—*
Frank, Arthur M., 4,329,979, Cl. 126-422.000.
Miller, John M., 4,330,212, Cl. 356-354.000.

Grumman Allied Industries, Inc.: *See—*
Maresca, Joseph A., 4,329,783, Cl. 33-169.00R.

Grund, Miroslaw: *See—*
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GTE Automatic Electric Laboratories, Inc.: *See—*
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GTE Products Corporation: *See—*
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Guell, Robert M.: *See—*
Arthur, Robert M.; Triatik, Jerome J.; Guell, Robert M.; and Masters, John F., 4,330,385, Cl. 204-195.00R.

Guery, Jean-Pierre; and Roblin, Bernard, to La Telemecanique Electrique. Multi-polar switch. 4,330,693, Cl. 200-1.00R.

Guinard, Pierre: *See—*
Legrand, Pierre; and Guinard, Pierre, 4,330,243, Cl. 425-111.000.

Gulett, Michael R.; Trudel, Murray L.; and Stewart, John K., Jr., to NCR Corporation. Method for conditioning nitride surface. 4,330,569, Cl. 427-38.000.

Gulf Oil Corporation: *See—*
Gilbert, Ronald E.; and Kochhar, Rajindar K., 4,330,652, Cl. 526-138.000.
Patel, Natu R.; and Rutter, Jerry L., 4,330,322, Cl. 71-96.000.

Gulf Research & Development Company: *See—*
Beach, David L.; Lunden, Richard W.; and Zambelli, Adolfo, 4,330,432, Cl. 252-429.00C.

Gumkowski, Bert A.: *See—*
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Gupta, Ramesh, to Exxon Research & Engineering Co. Hydroprocessing reactor with extended operating life. 4,330,505, Cl. 422-217.000.

Gurries, Raymond A., to Resonant Technology Co. Resonant system speed control. 4,330,156, Cl. 299-37.000.

Guyomar, Pierre-Yves: *See—*
Astruc, Michel; Guyomar, Pierre-Yves; and Lestrade, Catherine, 4,330,387, Cl. 204-275.000.

Habich, Adolph B.; and Hunt, Ronald E., to International Business Machines Corporation. Apparatus for connecting and disconnecting a motor and a print element by pivoting a ribbon cartridge. 4,330,218, Cl. 400-144.200.

Hachiya, Takeo. Power transmission mechanism for hybrid type flywheel device. 4,329,889, Cl. 74-858.000.

Haddad, William G. Portable water ski rack. 4,330,065, Cl. 211-60.0SK.

Haeber, Bernard: *See—*
Murphy, Peter; King, David H.; and Haeber, Bernard, 4,330,019, Cl. 144-312.000.

Haglund, Bengt O.: *See—*
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Hajime Industries Ltd.: *See—*
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Haldorn, Jurgen: *See—*
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Hall, Bobby E.; and Walker, Michael L., to Halliburton Company. Method of and solvent for removing inorganic fluoride deposits. 4,330,419, Cl. 252-8.55B.

Halle, Reidar; Lewis, Roger N.; and Muenchow, John R., to U.S. Peroxygen Company. Novel method of crosslinking/foaming of low density polyethylene using linear peroxyketals. 4,330,495, Cl. 264-54.000.

Hallenbeck, Bennett L.: *See—*
Cooper, Earl A.; and Hallenbeck, Bennett L., 4,330,166, Cl. 339-143.00R.

Hallford, Ben R., to Rockwell International Corp. Balun coupled microwave frequency converter. 4,330,868, Cl. 455-327.000.

Halliburton Company: *See—*
Hall, Bobby E.; and Walker, Michael L., 4,330,419, Cl. 252-8.55B.

Halttula, Jorma, to Aaltosen Tehtaat Oy Sarvis. Substratus crate for plant cultivation and transportation. 4,329,813, Cl. 47-66.000.

Hamada, Akiko, to Japan (Impex) Limited. Process for producing fruit extracts. 4,330,565, Cl. 426-431.000.

Hampton, J. E., to Smith International, Inc. Marine riser connector. 4,330,140, Cl. 285-39.000.

Hanaoka, Katsuyuki: *See—*
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Hanawa, Kazuhiko: *See—*
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Hancock, William S.: *See—*
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Hane, Paul C.; and Moore, Harold D., to Frac-Well, Inc. Fracturing apparatus. 4,329,925, Cl. 102-310.000.

Hannon, Martin J.; Vyas, Rajal M.; and Schwarz, Rudolph R., to Celanese Corporation. Thermoplastic elastomer powder coatings. 4,330,672, Cl. 528-493.000.

Hans Grohe GmbH & Co. KG.: *See—*
Finkbeiner, Werner, 4,330,089, Cl. 239-383.000.

Hanyu, Susumu; and Oshima, Takao, to Janome Sewing Machine Co., Ltd. Needle holding device for sewing machines. 4,329,934, Cl. 112-226.000.

Hara, Toshitami: *See—*
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Harada, Kunihiro: *See—*
Tashiro, Mituru; Harita, Yoshiyuki; and Harada, Kunihiro, 4,330,612, Cl. 430-286.000.

Harburn, Brian; and Miller, John C., to Boeing Company, The. Shot peen forming of compound contours. 4,329,862, Cl. 72-53.000.

Hardinge Brothers, Inc.: *See—*
Peterson, Anders A., 4,329,785, Cl. 33-185.00R.

Hardison, Leslie C.: *See—*
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Harford, Stephen: *See—*
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Harita, Yoshiyuki: *See—*
Tashiro, Mituru; Harita, Yoshiyuki; and Harada, Kunihiro, 4,330,612, Cl. 430-286.000.

Harris, Robert G., to Dowty Mining Equipment Limited. Mining apparatus. 4,330,154, Cl. 299-1.000.

Hartley, Peter. Sound amplifiers. 4,330,754, Cl. 330-264.000.

Hartmann, Heinrich: *See—*
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Hasegawa, Yuji: *See—*
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Hashimoto, Atsumi; and Takagi, Kazumasa, to Nissan Motor Co., Ltd. Fully-automatic antenna driving device. 4,330,782, Cl. 343-715.000.

Hashimoto, Noriyoshi; Ito, Mikio; and Tamura, Kikuo, to Nippon Kogaku K.K. Spectrophotometer receiving a variable quantity of light. 4,330,209, Cl. 356-328.000.

Hashimoto, Noriyoshi; Ito, Mikio; and Tamura, Kikuo, to Nippon Kogaku K.K. Spectrophotometer capable of correcting a dark current. 4,330,210, Cl. 356-328.000.

Hastings, Jerome K.; and Lamboy, George F., to Eaton Corporation. Pushbutton circuit breaker switch. 4,330,772, Cl. 337-43.000.

Hatabe, Etsuo; Kato, Masatoshi; Tokugawa, Fumitake; and Nozawa, Toshiharu, to Mitsubishi Denki Kabushiki Kaisha. Method of controlling thermally controlling a thermal printing head. 4,330,786, Cl. 346-76.0PH.

Hatano, Yoshihiro; and Yamamoto, Kenji, to Yamamoto Kagaku Gosei Kabushiki Kaisha. Recording material. 4,330,473, Cl. 549-226.000.

Hattori, Hiroyuki: *See—*
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Hattori, Masayuki: *See—*
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Hattori, Shinichiro, to Olympus Optical Co., Ltd. Data recording device. 4,330,186, Cl. 354-106.000.

Hauck, James P.; Hayes, Cecil L.; and McMullen, James D., to Rockwell International Corporation. Apparatus for generating temporally shaped, laser pulses. 4,330,721, Cl. 307-425.000.

Hauni-Werke Korber & Co. KG.: *See—*
Pawelko, Karl-Heinz; and Deutsch, Reinhard, 4,329,898, Cl. 83-251.000.
Rudszinat, Willy; and Abrahams, Siegfried, 4,330,061, Cl. 209-3.100.

Haussuehl, Siegfried: *See—*
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Havemann, Robert K., to Thermo King Corporation. Engine control. 4,329,957, Cl. 123-378.000.

Hawn, David D.; and Reim, Robert E., to Dow Chemical Company, The. Reductive pyrolysis method for determining trace sulfur. 4,330,298, Cl. 23-230.0PC.
Hayashi, Akira: *See*—
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Hayashi, Kazuo, to Kabushiki Kaisha Morita Seisakusho. Holder for a dental handpiece. 4,330,281, Cl. 433-108.000.
Hayashi, Norihito, to Toa Medical Electronic Co., Ltd. Method and apparatus for counting blood platelets. 4,330,745, Cl. 324-71.0CP.
Hayashi, Shozo: and Tomiyama, Susumu, to Tanaka Denshi Kogyo Kabushiki Kaisha. Gold bonding wire for semiconductor elements and the semiconductor element. 4,330,329, Cl. 420-511.000.
Hayashi, Yoshiaki: *See*—
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Hayashi, Yoshinori: *See*—
Nishimatsu, Mineaki; Mukai, Sadayoshi; Hayashi, Yoshinori; Yamaguchi, Osamu; Ito, Akira; and Ahiko, Nobuo, 4,330,439, Cl. 252-570.000.
Hayes, Cecil L.: *See*—
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Haynes, Harvey H.; and Rail, Robert D., to United States of America, Navy. Lightweight concrete using polymer filled aggregate for ocean applications. 4,330,632, Cl. 501-140.000.
Hayward, C. Michael. Matrix board. 4,330,684, Cl. 174-68.500.
Healey, Robert W. Multi-purpose adjustable table and bench device. 4,330,151, Cl. 297-157.000.
Heaney, Audrey C. Orthotic foot assist apparatus. 4,329,982, Cl. 128-80.00E.
Hearn, Milton T. W.: *See*—
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Hedges, James H.: *See*—
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Heers, Edward A., to Hornady Manufacturing Company. Reloading apparatus having improved primer mechanism. 4,329,906, Cl. 86-36.000.
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Heider, Ulrich: *See*—
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Heil, Donald J.; and Albert, Thomas W., to American Hospital Supply Corporation. Fluid spray system for dental handpiece. 4,330,279, Cl. 433-82.000.
Heim, Derold D.: *See*—
Rawlings, Robert M.; Heim, Derold D.; and Morain, Ronald E., 4,330,191, Cl. 354-345.000.
Heimberger, Helmut, to Optilon W. Erich Heilmann GmbH. Apparatus for producing coupling elements for slide-fastener stringer. 4,330,244, Cl. 425-115.000.
Heimeier, Helmut H.; Klein, Wielfried; Klink, Erich; and Wernicke, Friedrich C., to International Business Machines Corporation. Method of and circuit arrangement for reading and/or writing an integrated semiconductor storage with storage cells in MTL (I^2L) technology. 4,330,853, Cl. 365-227.000.
Heins, Ferdinand; Tork, Leo; and Hohne, Wolfgang, to Bayer Aktiengesellschaft. Process for dressing leather by a treatment using rubber latices. 4,330,597, Cl. 428-473.000.
Heist, Hans; and Topfer, Dieter, to Hoechst Aktiengesellschaft. Doctor blade device in automatic processors for printing plates. 4,329,936, Cl. 118-100.000.
Hellums, James R.: *See*—
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Helman, Donald D.: *See*—
United States of America, National Aeronautics and Space Administration; Holt, Jack W.; Helman, Donald D.; and Smiser, Laurence W., 4,330,572, Cl. 427-140.000.
Henkel Kommanditgesellschaft auf Aktien: *See*—
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Henry, Helen G., to United States of America, Interior. Separation of zirconium and uranium. 4,330,509, Cl. 423-85.000.
Henson, Robert W. J., to Beldam Packing & Rubber Company Limited, The. Packing for making closed loop seal. 4,330,136, Cl. 277-228.000.
Her Majesty the Queen in Right of Ontario as represented by the Minister of Natural Resources: *See*—
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Herrmann, Werner M.: *See*—
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Herrold, Lear C., to Westinghouse Electric Corp. Ceramic greenware support. 4,330,270, Cl. 432-259.000.
Hershey, George E., to Honeywell Inc. Adjustable overload mechanism for a differential pressure transmitter. 4,329,877, Cl. 73-706.000.
Hertel, Otto; Beyer, Karl-Heinz; Wallis, Albrecht H.; Wulz, Klaus; and Izi, Kamuran, to BASF Aktiengesellschaft. Preparation of aminoalkyl half-esters of sulfuric acid. 4,330,480, Cl. 260-458.00R.
Herzl, Peter J., to Fischer & Porter Co. Vortex-shedding flowmeter with torsional sensor mounted on torque tube. 4,329,880, Cl. 73-861.240.
Hetrick, Glenn C. Safe blade structures for mowing vegetation. 4,329,834, Cl. 56-295.000.
Hewitt, Harvey J., to Xerox Corporation. Method of imaging overcoated photoreceptor containing gold injecting layer. 4,330,610, Cl. 430-126.000.
Hewlett-Packard Company: *See*—
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Heyer, Arthur J.; Springer, Edward M.; and Clay, Wallace C. Electronic stencil cutter. 4,330,798, Cl. 358-291.000.
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Hideo, Sato; Teruo, Takiguchi; Norio, Akimoto; and Ikuo, Ueno, to Asahi Kasei Kogyo Kabushiki Kaisha. Process for producing aromatic polyester with transition metal salt of naphthenic acid. 4,330,668, Cl. 528-271.000.
Hiebert, Jacob: *See*—
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Hien, Nguyen V.: *See*—
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Higgins, Gerald V., to Kurtz, Seymour J., a part interest. Metering device. 4,330,490, Cl. 261-62.000.
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Hika, Yoshihiko: *See*—
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Hill, Kenneth O.: *See*—
Johnson, Derwyn C.; Kawasaki, Brian S.; and Hill, Kenneth O., 4,330,170, Cl. 350-96.160.
Hill, Robert L., to Owens-Corning Fiberglas Corporation. Apparatus for flowing streams of fiber-forming material for attenuation to fibers or filaments. 4,330,312, Cl. 65-1.000.
Hillerstro, Bjorn, to AB CTC. Heat exchanger. 4,330,035, Cl. 165-164.000.
Hing, Peter; and Khan, Ehsan U., to Thorn EMI Limited. Heat-resistant sealing materials. 4,330,629, Cl. 501-47.000.
Hintz, Carmen R., to Morgan Actuators, Inc. Nutating motor coupling. 4,330,725, Cl. 310-82.000.
Hinz, Hans D.; Rothgordt, Ulf; and Lobl, Herbert, to U.S. Philips Corporation. Printing device for electrophoretic recording. 4,330,788, Cl. 346-157.000.
Hirai, Eiichi: *See*—
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Hirata, Katsuhiko: *See*—
Terai, Shiro; Amitani, Toshio; Suzuki, Toshio; Hirata, Katsuhiko; and Andoh, Makoto, 4,330,344, Cl. 148-6.200.
Hirayama, Chikara; and Wagner, George R., to United States of America, Energy. Resistive coating for current conductors in cryogenic applications. 4,330,347, Cl. 148-31.500.
Hirose, Hiroshi: *See*—
Nogami, Taro; and Hirose, Hiroshi, 4,330,207, Cl. 356-318.000.
Hirota, Toshio, to Nissan Motor Co., Ltd. Excess air factor control device for an alcohol reformed gas engine. 4,329,944, Cl. 123-3.000.
Hirsh Company: *See*—
Ferdinand, Irwin J.; Sylvan, Richard; and Peterson, Michael, 4,330,113, Cl. 269-88.000.
Hiruma, Eikyu: *See*—
Shidara, Keiichi; Goto, Naohiro; Kawamura, Tatsuro; Hiruma, Eikyu; Ikeda, Yohitsumu; Tanioka, Kenkichi; Hirai, Tadaaki; Takasaki, Yukio; Kusano, Chushirou; Uda, Tsuyoshi; and Nonaka, Yasuhiko, 4,330,733, Cl. 313-386.000.
Hitachi Koki Company, Limited: *See*—
Miyasaka, Masao; and Kobayashi, Tsuneki, 4,330,219, Cl. 400-690.400.
Hitachi, Ltd.: *See*—
Kobayashi, Isamu, 4,330,840, Cl. 364-705.000.

Konishi, Hiroo, 4,330,815, Cl. 363-35.000.
Miyamoto, Satoru; and Yoshida, Takeo, 4,330,734, Cl. 313-390.000.
Nagase, Hiroshi; Okuyama, Toshiaki; Kubota, Yuzuru; and Suzuki, Katsunori, 4,330,741, Cl. 318-803.000.
Nogami, Taro; and Hirose, Hiroshi, 4,330,207, Cl. 356-318.000.
Oikawa, Saburo; Murakami, Susumu; and Terasawa, Yoshio, 4,329,772, Cl. 29-571.000.
Okada, Sadayuki; and Sonobe, Hisao, 4,330,033, Cl. 165-104.270.
Okudaira, Sadayuki; Suzuki, Keizo; Nishimatsu, Shigeru; and Kanomata, Ichiro, 4,330,384, Cl. 204-192.00E.
Shidara, Keiichi; Goto, Naohiro; Kawamura, Tatsuro; Hiruma, Eikyu; Ikeda, Yohitsumu; Tanioka, Kenkichi; Hirai, Tadaaki; Takasaki, Yukio; Kusano, Chushirou; Uda, Tsuyoshi; and Nonaka, Yasuhiko, 4,330,733, Cl. 313-386.000.
Takasaki, Yoshitaka; and Yoshine, Hiroki, 4,330,856, Cl. 370-102.000.
Yoneda, Kenji; Nakazato, Masao; Yuminaka, Takeo; Sakata, Kazuhiro; and Kuzunuki, Soshiro, 4,330,838, Cl. 364-580.000.

Hiyama, Kunihiko: *See*—
Ueda, Tatehito; and Hiyama, Kunihiko, 4,329,965, Cl. 123-569.000.

Hobart Corporation: *See*—
George, Mark S.; and Stucke, Arthur W., 4,330,097, Cl. 242-187.000.

Hodsall, Brian A., to Molins Limited. Cigarette making machine hopper. 4,330,001, Cl. 131-108.000.

Hoechst Aktiengesellschaft: *See*—
Becker, Udo; Busch, Wolfram; Fischer, Johann P.; and Sommer, Werner, 4,329,992, Cl. 128-272.000.
Heist, Hans; and Topfer, Dieter, 4,329,936, Cl. 118-100.000.
Klippert, Heinz; and Ulmschneider, Dieter, 4,330,653, Cl. 526-200.000.
Lehr, Klaus; Heymer, Gero; Stephan, Hans-Werner; and Thummler, Ursus, 4,330,504, Cl. 422-205.000.
Martini, Thomas; Erckel, Rudiger; Fruhbeis, Horst; Rosch, Gunter; and Probst, Heinz, 4,330,427, Cl. 252-301.240.
May, Adolf; and Voetz, Franz J., 4,330,341, Cl. 106-308.00N.

Hof, Erwin: *See*—
Debus, Gerhard; Hof, Erwin; and Herrmann, Gunter, 4,329,975, Cl. 126-192.000.

Hoffend, Thomas R.; and Nelson, Robert A., to Xerox Corporation. Process for preparing colored toner particles employing a halogen salt to inhibit the aqueous phase polymerization. 4,330,460, Cl. 524-849.000.

Hoffman, Clark R., to United States of America, Navy. Automatic actuator for variable speed pump. 4,330,238, Cl. 417-19.000.

Hoffman, John G.: *See*—
Ryno, Gaylon E.; and Hoffman, John G., 4,330,784, Cl. 343-771.000.

Hoffmann, Hellmut, to Bayer Aktiengesellschaft. Process for the preparation of halogenoalkenes. 4,330,482, Cl. 260-465.00G.

Hoffmann, Jurgen: *See*—
Eck, Werner; and Hoffmann, Jurgen, 4,330,006, Cl. 137-514.000.

Hoffmann-La Roche Inc.: *See*—
Dierassi, David; and Murray, David, 4,330,438, Cl. 252-552.000.
Li, Choh H., 4,330,465, Cl. 260-112.50E.

Hofmann, Albert; and Schnapper, Christoph, to Kernforschungszentrum Karlsruhe Gesellschaft mit beschrankter Haftung. Method and apparatus for replenishing the helium bath in the rotor of a superconducting generator. 4,329,849, Cl. 62-55.000.

Hofmeister, Helmut: *See*—
Annen, Klaus; Laurent, Henry; Hofmeister, Helmut; Petzoldt, Karl; and Wiechert, Rudolf, 4,330,541, Cl. 424-243.000.

Hofsass, Peter. Coil form with heat switch. 4,330,773, Cl. 337-365.000.

Hogg, John A. Frame for comb honey. 4,329,749, Cl. 6-2.00R.

Hogue, Marcus P.: *See*—
Baldwin, Samuel L.; and Hogue, Marcus P., 4,330,814, Cl. 362-267.000.

Hohman, Charles: *See*—
Propster, Mark A.; Seng, Stephen; and Hohman, Charles, 4,330,314, Cl. 65-27.000.

Hohman, Charles M.; Propster, Mark A.; and Seng, Stephen, to Owens-Corning Fiberglas Corporation. Preheat hopper agitators. 4,330,313, Cl. 65-2.000.

Hohman, Charles M.; Propster, Mark A.; and Seng, Stephen, to Owens-Corning Fiberglas Corporation. Method of preheating glass pellets. 4,330,316, Cl. 65-27.000.

Hohne, Wolfgang: *See*—
Heins, Ferdinand; Tork, Leo; and Hohne, Wolfgang, 4,330,597, Cl. 428-473.000.

Holcroft & Company: *See*—
Shefsiek, Paul K., 4,330,031, Cl. 165-76.000.

Holden, Ernest M., to British Gas Corporation. Frequency correction circuitry for pipeline sensor apparatus. 4,330,748, Cl. 324-225.000.

Holec N.V.: *See*—
Dijkhuis, Jacob I., 4,330,399, Cl. 209-214.000.

Holland, Henry A. N., to Raymond International Builders, Inc. Pipe lining apparatus. 4,329,937, Cl. 118-105.000.

Hollymatic Corporation: *See*—
Wagner, Richard C., 4,329,828, Cl. 53-122.000.

Holt, Jack W.: *See*—
United States of America, National Aeronautics and Space Administration; Holt, Jack W.; Helman, Donald D.; and Smiser, Laurence W., 4,330,572, Cl. 427-140.000.

Holzle, Gerd: *See*—
Gati, Sandor; and Holzle, Gerd, 4,330,469, Cl. 260-242.200.

Honda Giken Kogyo Kabushiki Kaisha: *See*—
Inoue, Kazuo; and Kogure, Hiroshi, 4,329,843, Cl. 60-274.000.

Honeywell Inc.: *See*—
Hershey, George E., 4,329,877, Cl. 73-706.000.
Maeda, Shosaku, 4,329,873, Cl. 73-190.0CV.
Maeda, Shosaku, 4,329,874, Cl. 73-190.0CV.

Honeywell Information Systems Inc.: *See*—
Dubuc, Joseph J., 4,330,844, Cl. 364-900.000.

Honkanen, Jerry P. Plow caddy. 4,329,791, Cl. 37-42.00R.

Honma, Masayuki: *See*—
Ishikawa, Yoshikazu; and Honma, Masayuki, 4,329,968, Cl. 123-573.000.

Hooker Chemicals & Plastics Corp.: *See*—
Campbell, Donald H.; and Quinn, Edward J., 4,330,515, Cl. 423-316.000.

Hoover, Lonnie D., to NL Industries, Inc. Dispersible hydrophilic polymer compositions. 4,330,414, Cl. 252-8.50A.

Hoppe, Lutz: *See*—
Bohmer, Branislaw; Hoppe, Lutz; Szablikowski, Klaus; Kudora, Dieter; and Behn, Rudolf, 4,330,441, Cl. 525-54.230.

Hori, Shinichi, to Asada Machinery Manufacturing Co., Ltd. Device for converting rotary motion of crank mechanism into linear motion for a flying cutter. 4,329,899, Cl. 83-320.000.

Hornady Manufacturing Company: *See*—
Heers, Edward A., 4,329,906, Cl. 86-36.000.

Horsma, David A.; Lyons, Bernard J.; and Smith-Johannsen, Robert, to Raychem Corporation. Layered self-regulating heating article. 4,330,703, Cl. 219-553.000.

Hoskinson, Robert L., deceased (by Hoskinson, Violet Vivian, heir), to Linhardt, Hans D. Power conversion system utilizing reversible energy of liquefied natural gas. 4,329,842, Cl. 60-39.46G.

Hoskinson, Violet Vivian, heir: *See*—
Hoskinson, Robert L., deceased, 4,329,842, Cl. 60-39.46G.

Howard, Robert W.: *See*—
Parkinson, Ronald; and Howard, Robert W., 4,330,380, Cl. 204-123.000.

Huang, Peter H. C.; Weller, Joseph F.; and Giallorenzi, Thomas G., to United States of America, Navy. Dispersion compensated acoustic surface waveguides using diffused substrates. 4,330,768, Cl. 333-153.000.

Hubele, Adolf; Eckhardt, Wolfgang; and Kunz, Walter, to Ciba-Geigy Corporation. Microbicidal N-1'-hydrocarbyloxycarbonylethyl)-N-alkoxyacetylanilines. 4,330,556, Cl. 424-309.000.

Huber, Hans-Peter, to AGFA-Gevaert Aktiengesellschaft. Apparatus for exposing, developing and disposing of remnants of film units. 4,330,185, Cl. 354-86.000.

Huff, Roger K., to Imperial Chemical Industries Limited. Halogenated esters. 4,330,675, Cl. 560-124.000.

Hughes Aircraft Company: *See*—
Wreede, John E.; Graube, Andrejs; and Mulvihill, Mark A., 4,330,604, Cl. 430-2.000.

Hughes, O. Richard, to Celanese Corporation. Supported acidic catalyst. 4,330,434, Cl. 252-430.000.

Humphries, Walter R. Flow apparatus. 4,329,940, Cl. 119-72.000.

Hunt, Keith R.: *See*—
Fisher, Sidney E.; and Hunt, Keith R., 4,329,917, Cl. 98-2.140.

Hunt, Ronald E.: *See*—
Habich, Adolph B.; and Hunt, Ronald E., 4,330,218, Cl. 400-144.200.

Hunter, William K.; Hardison, Leslie C.; and Dowd, Edward J., to Air Resources, Inc. Catalytic fume incineration. 4,330,513, Cl. 423-245.000.

Husky Injection Molding Systems, Inc.: *See*—
Rees, Herbert; Brown, Paul; and Grund, Miroslaw, 4,330,257, Cl. 425-556.000.

Hutchins, Ferris L., Jr.: *See*—
Gebhardt, James L.; and Hutchins, Ferris L., Jr., 4,330,102, Cl. 248-459.000.

Huxhorn, Gunter: *See*—
von und zu Aufsess, Friedrich F.; Huxhorn, Gunter; Pohl, Hans; and Sasse, Wolfgang, 4,330,499, Cl. 264-289.600.

Hyde, Eric A.; Goldsmith, Hugh A.; and Proudlove, Michael J., to Nuclear Power Company Limited. Non-destructive test apparatus. 4,330,865, Cl. 376-249.000.

Hydro-Test Inc.: *See*—
Ball, Frank C.; and Wardle, Edmund, 4,329,872, Cl. 73-49.500.

Igi, Keishiro: *See*—
Takahashi, Hideo; Igi, Keishiro; Ogawara, Hisashi; and Nakayasu, Haruo, 4,330,459, Cl. 523-148.000.

Iida, Mitsuhiko, to Toshiba Kikai Kabushiki Kaisha. Inking control apparatus for printing machines. 4,329,923, Cl. 101-365.000.

Iida, Toshihide: *See*—
Komori, Shigehiro; Sakamaki, Hisashi; Hattori, Hiroyuki; Iida, Toshihide; Miyamoto, Koichi; and Umezawa, Kazumi, 4,330,199, Cl. 355-14.0CH.

Ikeda, Sunao: *See*—
Kikuchi, Hideo; Kaneko, Tamaki; Ikeda, Sunao; Okuzawa, Tugio; Kakitani, Yohtaro; and Hibi, Kunio, 4,330,200, Cl. 355-24.000.

Ikeda, Yohitsumu: *See*—
Shidara, Keiichi; Goto, Naohiro; Kawamura, Tatsuro; Hiruma, Eikyu; Ikeda, Yohitsumu; Tanioka, Kenkichi; Hirai, Tadaaki; Takasaki, Yukio; Kusano, Chushirou; Uda, Tsuyoshi; and Nonaka, Yasuhiko, 4,330,733, Cl. 313-386.000.

Ikegami, Tadashi: *See*—
Sakurai, Hisaya; Katayama, Yoshihiko; Ikegami, Tadashi; and Furusato, Masayasu, 4,330,646, Cl. 526-116.000.

Sakurai, Hisaya; Katayama, Yoshihiko; Ikegami, Tadashi; and Furusato, Masayasu, 4,330,647, Cl. 526-116.000.
Sakurai, Hisaya; Katayama, Yoshihiko; Ikegami, Tadashi; and Furusato, Masayasu, 4,330,651, Cl. 526-127.000.
Ikeguchi, Nobuyuki; and Kimbara, Hidenori, to Mitsubishi Gas Chemical Company, Inc. Curable resin composition. 4,330,658, Cl. 528-73.000.
Ikeguchi, Nobuyuki; and Osaki, Yasunori, to Mitsubishi Gas Chemical Company, Inc. Curable resin composition. 4,330,669, Cl. 528-289.000.
Ikuo, Ueno: *See—*
Hideo, Sato; Teruo, Takiguchi; Norio, Akimoto; and Ikuo, Ueno, 4,330,668, Cl. 528-271.000.
Illinois Tool Works Inc.: *See—*
Klygis, Mindaugas J., 4,330,058, Cl. 206-150.000.
Imada, Isuke: *See—*
Sugihara, Hirosada; Watanabe, Masazumi; Kawada, Mitsuru; and Imada, Isuke, 4,330,554, Cl. 424-285.000.
Imai, Chikara: *See—*
Eda, Tadahiro; Tatsumi, Susumu; and Imai, Chikara, 4,330,749, Cl. 324-457.000.
Imanaka, Hiroshi; and Nishida, Minoru, to Fujisawa Pharmaceutical Co., Ltd. Antibacterial composition. 4,330,529, Cl. 424-114.000.
Imazeki, Ryoji; Hattori, Masayuki; and Nakamura, Shigeo, to Fujitsu Fanuc Limited. Overcurrent protection apparatus. 4,330,816, Cl. 363-56.000.
Impallomeni, Enrico; and Montagna, Roberto, to CSELT - Centro Studi e Laboratori Telecomunicazioni S.p.A. Digital equalizer for signal receiver in QPSK data-transmission system. 4,330,861, Cl. 375-15.000.
Imperial Chemical Industries, Limited: *See—*
Brierley, David; Ridyard, Denis R. A.; and Yelland, Michael, 4,330,468, Cl. 260-198.000.
Huff, Roger K., 4,330,675, Cl. 560-124.000.
Moxham, Peter H., 4,330,676, Cl. 562-416.000.
Inayama, Takayuki: *See—*
Minamizono, Junji; Kishimoto, Shinzo; and Inayama, Takayuki, 4,330,618, Cl. 430-528.000.
Industrial Electronic Hardware Corp.: *See—*
Pittman, Robert B.; Wescott, Ronald O.; and Offerman, Michael, 4,330,164, Cl. 339-49.00R.
Industriventilation Produkt AB: *See—*
Larsson, Sven A. H., 4,329,855, Cl. 62-473.000.
Inland Steel Company: *See—*
Lee, Harvie H.; and Kim, Yong-Wu, 4,330,598, Cl. 428-653.000.
Inoue, Kazuo; and Kogure, Hiroshi, to Honda Giken Kogyo Kabushiki Kaisha. Exhaust passage system of six cylinder engines. 4,329,843, Cl. 60-274.000.
Inoue, Satoshi: *See—*
Matsuoka, Kyoichiro; Irie, Nobuyasu; Inoue, Satoshi; Ito, Katsuto; and Yata, Isao, 4,330,111, Cl. 266-106.000.
Inoue, Shinichi: *See—*
Kashiwabara, Hirotaka; Shirai, Mamoru; and Inoue, Shinichi, 4,330,770, Cl. 335-112.000.
Institut National de la Recherche Agronomique: *See—*
Staron, Thadee J., 4,330,560, Cl. 426-7.000.
Instrumentation Laboratory Inc.: *See—*
Dennison, Allan G., Jr.; Smith, Stanley B., Jr.; Fonteyn, Robert A.; and Jarratt, Robert V., Jr., 4,330,776, Cl. 340-365.00R.
International Business Machines Corporation: *See—*
Alvarez, Joseph A., III; Bensadon, Joseph M.; Brennen, John F.; and Krug, Robert W., 4,330,857, Cl. 370-104.000.
Chen, Wen-Hsien; and Lean, Eric G., 4,329,876, Cl. 73-618.000.
Choquet, Michel F., 4,330,858, Cl. 370-111.000.
Churgovich, Dennis M.; Joest, William F., III; McCray, William R.; and Rutkowski, Edward V., Jr., 4,330,217, Cl. 400-64.000.
Damerau, Frederick J., 4,330,845, Cl. 364-900.000.
Gambino, Richard J.; and Taylor, Robert C., 4,330,848, Cl. 365-32.000.
Geipel, Henry J., Jr.; and Shasteen, Richard B., 4,329,773, Cl. 29-571.000.
Habich, Adolph B.; and Hunt, Ronald E., 4,330,218, Cl. 400-144.200.
Heimeier, Helmut H.; Klein, Wielfried; Klink, Erich; and Wernicke, Friedrich C., 4,330,853, Cl. 365-227.000.
Karol, Kenneth N., 4,330,803, Cl. 360-99.000.
Kuseski, Roger E., 4,330,847, Cl. 364-900.000.
Moyer, William A.; and Wood, Robert L., 4,330,614, Cl. 430-325.000.
Murphy, Alan S., 4,330,834, Cl. 364-521.000.
International Computers Limited: *See—*
Mayor, Colin, 4,330,750, Cl. 328-55.000.
International Flavors & Fragrances Inc.: *See—*
Boden, Richard M.; Dekker, Lambert; Schmitt, Frederick L.; and Van Loveren, Augustinus G., 4,330,415, Cl. 252-8.600.
Boden, Richard M., 4,330,417, Cl. 252-8.900.
Boden, Richard M.; Dekker, Lambert; Schmitt, Frederick L.; and Van Loveren, Augustinus G., 4,330,425, Cl. 252-187.00H.
Sprecker, Mark A., 4,330,416, Cl. 252-8.900.
International Harvester Company: *See—*
Kolinger, Kenneth J., 4,330,134, Cl. 277-42.000.
International Minerals & Chemical Corp.: *See—*
Michalski, Dennis H., 4,330,517, Cl. 423-321.00R.
International Telephone and Telegraph Corporation: *See—*
Arnold, Bruce K., 4,330,168, Cl. 339-276.00T.
Frederick, Stanley H., 4,330,412, Cl. 210-805.000.
Internationale Octrooi Maatschappij "Octropa" B.V.: *See—*
Luijerink, Jan H., 4,330,463, Cl. 260-112.00B.
von und zu Aufsess, Friedrich F.; Huxhorn, Gunter; Pohl, Hans; and Sasse, Wolfgang, 4,330,499, Cl. 264-289.600.
Inui, Nobuo: *See—*
Kato, Yasutoshi; and Inui, Nobuo, 4,330,335, Cl. 106-99.000.
Iota Engineering, Inc.: *See—*
Perper, Lloyd J., 4,330,736, Cl. 315-209.00R.
Irie, Nobuyasu: *See—*
Matsuoka, Kyoichiro; Irie, Nobuyasu; Inoue, Satoshi; Ito, Katsuto; and Yata, Isao, 4,330,111, Cl. 266-106.000.
Irnich, Rudolf: *See—*
Kuessner, Klaus; Irnich, Rudolf; Scharpenberg, Hans-Georg; and Volkamer, Klaus, 4,330,305, Cl. 55-48.000.
Ishida, Akira: *See—*
Yamada, Hazime; and Ishida, Akira, 4,330,841, Cl. 364-784.000.
Ishihara, Akira, to Kabushiki Kaisha Komatsu Seisakusho. Cylinder block structure of an internal combustion engine. 4,329,947, Cl. 123-41.740.
Ishii, Takashi: *See—*
Yamaguchi, Hiroyasu; and Ishii, Takashi, 4,330,755, Cl. 330-271.000.
Ishikawa, Eizi: *See—*
Yano, Kiyotosi; Ishikawa, Eizi; and Yoshiyama, Shigeru, 4,330,004, Cl. 137-343.000.
Ishikawa, Yoshikazu; and Honma, Masayuki, to Nissan Motor Co., Ltd. Oil separating system for blowby gas. 4,329,968, Cl. 123-573.000.
Italimpianti Societa' Italiana Impianti p.A.: *See—*
Kranzl, Franz A.; and Springer, Helmut, 4,330,262, Cl. 432-3.000.
Itani, Seiichi, to Kubota Ltd. Electronic weighing apparatus. 4,330,837, Cl. 364-567.000.
Itil, Turan M.; Laudahn, Gerhard; and Herrmann, Werner M., to Schering Aktiengesellschaft. Use of estradiol valerate as an antidepressant. 4,330,538, Cl. 424-238.000.
Ito, Akira: *See—*
Nishimatsu, Mineaki; Mukai, Sadayoshi; Hayashi, Yoshinori; Yamaguchi, Osamu; Ito, Akira; and Ahiko, Nobuo, 4,330,439, Cl. 252-570.000.
Ito, Katsuto: *See—*
Matsuoka, Kyoichiro; Irie, Nobuyasu; Inoue, Satoshi; Ito, Katsuto; and Yata, Isao, 4,330,111, Cl. 266-106.000.
Ito, Mikio: *See—*
Hashimoto, Noriyoshi; Ito, Mikio; and Tamura, Kikuo, 4,330,209, Cl. 356-328.000.
Hashimoto, Noriyoshi; Ito, Mikio; and Tamura, Kikuo, 4,330,210, Cl. 356-328.000.
Ito, Takaaki; and Nakamura, Norihiko. Variable venturi type carburetor. 4,330,489, Cl. 261-44.00C.
Itoh, Haruo: *See—*
Konishi, Jirou; Takasaki, Yasuto; Ohkoshi, Kenji; Ozeki, Akichika; Kajikawa, Shuji; and Itoh, Haruo, 4,330,264, Cl. 432-77.000.
Ivanics, Jozsef: *See—*
Simonidesz, Vilmos; Papp nee Behr, Agnes; Kovacs, Gabor; Ivanics, Jozsef; Der nee Foldvary, Julia; Stadler, Istvan; and Pallagi, Istvan, 4,330,553, Cl. 424-285.000.
Iwabuchi, Yoshitaka; and Nozaki, Masao, to Victor Company of Japan, Ltd. Transducer feeding mechanism in an apparatus for recording and reproducing a signal on and from a rotary recording medium. 4,330,806, Cl. 360-106.000.
Iwabuchi, Yoshitaka: *See—*
Ohara, Terumi; Mizuno, Yoshio; Iwabuchi, Yoshitaka; and Oketani, Kenzi, 4,330,791, Cl. 358-8.000.
Iwamoto, Akito; and Sekizawa, Hidekazu, to Tokyo Shibaura Denki Kabushiki Kaisha. Apparatus for inspecting defects in a periodic pattern. 4,330,775, Cl. 340-146.30P.
Iwaosa, Katsuaki: *See—*
Ohashi, Minoru; and Iwaosa, Katsuaki, 4,330,617, Cl. 430-405.000.
Iwata, Akira; and Fukushima, Shizunobu, to Sekisui Kagaku Kogyo Kabushiki Kaisha. Reinforced foamed resin structural material and process for manufacturing the same. 4,330,494, Cl. 264-46.200.
Iwata, Riso, to Nippon Zeon Co., Ltd. Process for producing cyclopentadiene resin. 4,330,448, Cl. 526-79.000.
Izi, Kamuran: *See—*
Hertel, Otto; Beyer, Karl-Heinz; Wallis, Albrecht H.; Wulz, Klaus; and Izi, Kamuran, 4,330,480, Cl. 260-458.00R.
J. I. Case Company: *See—*
Parquet, Donald J.; and Pedersen, Carl O., 4,329,845, Cl. 60-422.000.
Shumaker, John F., 4,329,797, Cl. 37-118.00R.
J. M. Huber Corporation: *See—*
Kostinko, John A., 4,330,518, Cl. 423-329.000.
Jackovitz, John F.; and Pantier, Earl A., to United States of America, Energy. High capacity nickel battery material doped with alkali metal cations. 4,330,603, Cl. 429-206.000.
Jackson, J. D. Stove with draft air cooling of rear, opposite side and flue pipe. 4,329,976, Cl. 126-312.000.
Jacobs, Erwin; Schwabe, Ulrich; and Takacs, Dezsoe, to Siemens Aktiengesellschaft. MNOS Memory cell. 4,330,850, Cl. 365-185.000.
Jagieniak, Peter; Koerdt, Hans; Bohme, Jochen; Odrich, Dieter; Pochert, Rudolf; and Wiese, Peter. Plasmaburner with contact protection. 4,330,700, Cl. 219-121.0PP.
Jain, Chandra P.; and Shu, Frank R., to Beckman Instruments, Inc. Albumin reagent and assay. 4,330,296, Cl. 23-230.00B.
James, Rex L.: *See—*
Miller, Bradley W.; Hickenlooper, Franklin T.; Uhlrich, David C.; Godfrey, Marl D.; Clifford, Douglas M.; James, Rex L.; Watson,

Robert E.; Keith, John C.; and Mortensen, Allen C., 4,330,839, Cl. 364-706.000.
Janome Sewing Machine Co., Ltd.: *See*—
Hanyu, Susumu; and Oshima, Takao, 4,329,934, Cl. 112-226.000.
Japan Aluminium Alloy Refiners Association: *See*—
Akiyama, Keiichi, 4,330,336, Cl. 106-104.000.
Japan (Impex) Limited: *See*—
Hamada, Akiko, 4,330,565, Cl. 426-431.000.
Japan Synthetic Rubber Co., Ltd.: *See*—
Tashiro, Mituru; Harita, Yoshiyuki; and Harada, Kunihiro, 4,330,612, Cl. 430-286.000.
Jaquiery, Henri: *See*—
Raye, Pierre; Jaquiery, Henri; and Gehri, Hermann, 4,330,227, Cl. 407-36.000.
Jarratt, Robert V., Jr.: *See*—
Dennison, Allan G., Jr.; Smith, Stanley B., Jr.; Fonteyn, Robert A.; and Jarratt, Robert V., Jr., 4,330,776, Cl. 340-365.00R.
Jarreau, Francois-Xavier; and Koenig, Jean J., to Etablissements Nativelle S.A. Amino-alkoxy pyrazoles and pharmaceutical compositions. 4,330,544, Cl. 424-248.560.
Javeri, Rupin J., to Motorola, Inc. Dwell circuitry for an ignition control system. 4,329,959, Cl. 123-416.000.
Jeanminet, Ginette: *See*—
Bugaut, Andree; and Jeanminet, Ginette, 4,330,291, Cl. 8-406.000.
Jeanvoine, Pierre L.; and Gardiol, Maurice, to Societe Europeenne des Produits Refractaires. Fused cast refractory compositions and glass melting furnaces incorporating them. 4,330,630, Cl. 501-105.000.
Jenne, Helmut: *See*—
Echte, Adolf; Gausepohl, Hermann; Jenne, Helmut; and Mittnacht, Hans, 4,330,641, Cl. 525-310.000.
Jensen, Michael L., to Raychem Corporation. Electrical devices comprising conductive polymers. 4,330,704, Cl. 219-553.000.
Jensen, Thomas H., to PPG Industries, Inc. High pressure forming bushing and fin cooler. 4,330,311, Cl. 65-1.000.
Jessen, Bruno, to Deutsche Babcock Aktiengesellschaft. Wet deasher. 4,329,929, Cl. 110-171.000.
Jim, Parsons P.: *See*—
Shermer, David A.; Jim, Parsons P.; and Laurance, Dale R., 4,330,407, Cl. 210-602.000.
Job, John L.; and Shaw, Peter S., to National Chemical Products Limited. Resinous polymeric substances. 4,330,667, Cl. 528-266.000.
Joest, William F., III: *See*—
Churgovich, Dennis M.; Joest, William F., III; McCray, William R.; and Rutkowski, Edward V., Jr., 4,330,217, Cl. 400-64.000.
John, Gunter: *See*—
Pietschmann, Frank; John, Gunter; Eistert, Theodor; Noack, Christian; Oliva, Klaus; Zumpe, Bernd; Spaida, Hans P.; Boltizar, Pal; Fabry, Istvan; Vida, Csongor; Lakos, Lajos; and Klement, Matjas, 4,329,832, Cl. 56-98.000.
John, Sam J.: *See*—
Lollis, Glen R.; Marler, Marvin G.; Car, Joe P.; and John, Sam J., 4,330,076, Cl. 228-119.000.
John Wyeth & Brother Limited: *See*—
Shepherd, Robin G., 4,330,546, Cl. 424-263.000.
Johns, Robert H., to Allegheny Ludlum Steel Corporation. Nozzle in a strip casting apparatus. 4,330,025, Cl. 164-423.000.
Johnson, David E.: *See*—
Coughlin, William J.; Johnson, David E.; and McCall, Kenneth E., 4,330,109, Cl. 266-67.000.
Johnson, Derwyn C.; Kawasaki, Brian S.; and Hill, Kenneth O., to Canadian Patents & Development Limited. Low-loss star couplers for optical fiber systems. 4,330,170, Cl. 350-96.160.
Johnson, Luther R., to Becton, Dickinson and Company. Gravity-induced stirring device for rotating liquid containers. 4,330,216, Cl. 366-222.000.
Johnson, Myron L.; and Badali, Joseph A., to Browning Arms Company. Electronic set trigger. 4,329,803, Cl. 42-84.000.
Johnson, Noble M.: *See*—
Biegesen, David K.; Johnson, Noble M.; Bartlelink, Dirk J.; and Moyer, Marvin D., 4,330,363, Cl. 156-620.000.
Johnson, Phillip L. M., to Plessey Overseas Limited. Sonar systems. 4,330,876, Cl. 367-105.000.
Johnston, Howard, to Dow Chemical Company, The. Compounds and method for selectively controlling grassy weeds in broadleaved crops. 4,330,321, Cl. 71-94.000.
Johnston, Laird E., to General Motors Corporation. Diesel injection pump timing control with electronic adjustment. 4,329,961, Cl. 123-502.000.
Johnston, Laird E., to General Motors Corporation. Diesel injection pump timing control with eccentric cam pin. 4,329,962, Cl. 123-502.000.
Jonasson, Bo E., to von Tell AB. Arrangement in mounting supplementary decks in ships. 4,329,935, Cl. 114-72.000.
Jones, David N.; and Kurtz, Stuart J., to Union Carbide Corporation. Method and apparatus for cooling film bubble of low strain hardening polymers. 4,330,501, Cl. 264-566.000.
Jorgensen, Ernst V.: *See*—
Jorgensen, Lars L. S.; Jorgensen, Ernst V.; and Petersen, John H., 4,330,260, Cl. 431-12.000.
Jorgensen, Lars L. S.; Jorgensen, Ernst V.; and Petersen, John H. Method and apparatus for regulating the combustion in a furnace. 4,330,260, Cl. 431-12.000.
Joseloff, Stanley S. Cooperative bagging check-out counter. 4,330,048, Cl. 186-66.000.
Joshi, David, to Colgate Palmolive Company. Free flowing builder beads and detergents. 4,330,424, Cl. 252-135.000.
Jude Engineering Inc.: *See*—
Butterfield, John P., 4,330,135, Cl. 277-102.000.
Jumer, John F. Method for containerless portable electro-polishing. 4,330,381, Cl. 204-129.600.
Jung, Michel: *See*—
Bey, Philippe; and Jung, Michel, 4,330,559, Cl. 424-319.000.
Junginger, Robert: *See*—
Boltersdorf, Dagmar; Junginger, Robert; Struck, Bernd D.; and Neumeister, Herbert, 4,330,378, Cl. 204-104.000.
Juza, Dirk; and Stein, Dieter, to BASF Aktiengesellschaft. Preparation of propylene homopolymers or copolymers. 4,330,645, Cl. 526-61.000.
Jydrpwatt Systems Limited: *See*—
Frey, Bernhard, 4,329,914, Cl. 92-105.000.
Kabushiki Kaisha Komatsu Seisakusho: *See*—
Ishihara, Akira, 4,329,947, Cl. 123-41.740.
Kabushiki Kaisha Morita Seisakusho: *See*—
Hayashi, Kazuo, 4,330,281, Cl. 433-108.000.
Kabushiki Kaisha Osaka Packing Seizosho: *See*—
Takahashi, Akira; and Takikawa, Toru, 4,330,519, Cl. 423-335.000.
Kabushiki Kaisha Polyurethan Engineering: *See*—
Toda, Kenichi, 4,329,869, Cl. 73-19.000.
Kabushiki Kaisha Tokai Rika Denki Seisakusho: *See*—
Ogawa, Akira, 4,330,694, Cl. 200-6.00A.
Kabushiki Kaisha Toyoda Jidoshokki Seisakusho: *See*—
Nakayama, Shozo; Kato, Kimio; Mukai, Takamitu; Fujii, Tomoo; and Kono, Hiroya, 4,329,913, Cl. 92-71.000.
Kajikawa, Shuji: *See*—
Konishi, Jirou; Takasaki, Yasuto; Ohkoshi, Kenji; Ozeki, Akichika; Kajikawa, Shuji; and Itoh, Haruo, 4,330,264, Cl. 432-77.000.
Kakimoto, Masakazu, to Ushio Air Tool Co., Ltd. Pneumatic bearing arrangement. 4,330,159, Cl. 308-9.000.
Kakitani, Yohtaro: *See*—
Kikuchi, Hideo; Kaneko, Tamaki; Ikeda, Sunao; Okuzawa, Tugio; Kakitani, Yohtaro; and Hibi, Kunio, 4,330,200, Cl. 355-24.000.
Kallert, Wilhelm: *See*—
Grogler, Gerhard; and Kallert, Wilhelm, 4,330,656, Cl. 528-52.000.
Kalopissis, Gregoire: *See*—
Bugaut, Andree; Vandenbossche, Jean-Jacques M.; Shahin, Majdi M.; and Kalopissis, Gregoire, 4,330,292, Cl. 8-411.000.
Kalve, Ernest. Load stress relief for walking dragline excavator base frames. 4,329,795, Cl. 37-116.000.
Kan, Peter T.: *See*—
Christman, Donald L.; and Kan, Peter T., 4,330,636, Cl. 521-155.000.
Kanayama, Toshiji: *See*—
Takayama, Yoshihiro; Endo, Fujio; Nozawa, Tsuneo; Masuda, Yoshiro; Mori, Motokuni; and Kanayama, Toshiji, 4,330,533, Cl. 424-181.000.
Kaneko, Tamaki: *See*—
Kikuchi, Hideo; Kaneko, Tamaki; Ikeda, Sunao; Okuzawa, Tugio; Kakitani, Yohtaro; and Hibi, Kunio, 4,330,200, Cl. 355-24.000.
Kanemoto, Tetsuaki: *See*—
Tanaka, Michio; Nasu, Kohji; and Kanemoto, Tetsuaki, 4,330,595, Cl. 428-425.500.
Kang, George S.; Fransen, Lawrence J.; and Kline, Evans L., to United States of America, Navy. Multirate digital voice communication processor. 4,330,689, Cl. 179-15.55R.
Kanomata, Ichiro: *See*—
Okudaira, Sadayuki; Suzuki, Keizo; Nishimatsu, Shigeru; and Kanomata, Ichiro, 4,330,384, Cl. 204-192.00E.
Kansai Paint Co., Ltd.: *See*—
Miyosawa, Yoshiaki, 4,330,446, Cl. 523-409.000.
Kantor, Frederick W. Device and method for aiding vision. 4,330,169, Cl. 350-9.000.
Kao Soap Co., Ltd.: *See*—
Sakurai, Akira, 4,329,991, Cl. 128-263.000.
Watanabe, Hiroshi; Mikata, Tsuruo; and Gohda, Kenichi, 4,330,526, Cl. 424-70.000.
Yamamura, Masaaki; Moriyama, Noboru; and Watanabe, Shin-ichi, 4,330,301, Cl. 44-51.000.
Karkhanis, Yashwant D., to Merck & Co., Inc. Process for solubilization of gonococcal antigen. 4,330,623, Cl. 435-68.000.
Karl Lautenschlager KG: *See*—
Lautenschlager, Reinhard, 4,329,759, Cl. 16-335.000.
Karol, Kenneth N., to International Business Machines Corporation. Disk accessing apparatus and method. 4,330,803, Cl. 360-99.000.
Karpati, Egon: *See*—
Nyeki, Olga; Kisfaludy, Lajos; Karpati, Egon; and Szporny, Laszlo, 4,330,532, Cl. 424-177.000.
Kashiwa, Norio: *See*—
Kioka, Mamoru; Kitani, Hiroaki; and Kashiwa, Norio, 4,330,649, Cl. 526-125.000.
Kashiwabara, Hirotaka; Shirai, Mamoru; and Inoue, Shinichi, to Fujitsu Limited. Magnetically controlled switching device. 4,330,770, Cl. 335-112.000.
Kastner, Erich, to Arnold & Richter Cine Technik GmbH & Co. Betriebs KG. Reflex device with a mirror substrate of vitreous carbon. 4,330,183, Cl. 352-206.000.
Kataoka, Tateshi: *See*—
Sakurai, Yoshio; Kataoka, Tateshi; and Oh-hashi, Fujiko, 4,330,534, Cl. 424-182.000.
Katayama, Kazuo, to Toyo Kogyo Co., Ltd. Safety means for automobile steering mechanisms. 4,330,139, Cl. 280-777.000.

Katayama, Yoshihiko: *See*—
Sakurai, Hisaya; Katayama, Yoshihiko; Ikegami, Tadashi; and Furusato, Masayasu, 4,330,646, Cl. 526-116.000.
Sakurai, Hisaya; Katayama, Yoshihiko; Ikegami, Tadashi; and Furusato, Masayasu, 4,330,647, Cl. 526-116.000.
Sakurai, Hisaya; Katayama, Yoshihiko; Ikegami, Tadashi; and Furusato, Masayasu, 4,330,651, Cl. 526-127.000.

Kato, Harumasa: *See*—
Nishihira, Yoshitaka; and Kato, Harumasa, 4,330,578, Cl. 428-13.000.

Kato, Kimio: *See*—
Nakayama, Shozo; Kato, Kimio; Mukai, Takamitu; Fujii, Tomoo; and Kono, Hiroya, 4,329,913, Cl. 92-71.000.

Kato, Masatoshi: *See*—
Hatabe, Etsuo; Kato, Masatoshi; Tokugawa, Fumitake; and Nozawa, Toshiharu, 4,330,786, Cl. 346-76.0PH.

Kato, Toshikazu; Saitou, Sinichi; Watanabe, Seizo; Nishiyama, Toyoo; Shimdda, Misao; Shibata, Tutomu; Kimura, Kenji; and Satoh, Ken, to Olympus Optical Co., Ltd. Magnetic cassette tape record and play apparatus. 4,330,802, Cl. 360-96.600.

Kato, Yasutoshi; and Inui, Nobuo, to Kubota, Ltd. Nonflammable building material and process for preparing same. 4,330,335, Cl. 106-99.000.

Kato, Yoshiei: *See*—
Nakanishi, Kyoji; Saito, Kenji; Kato, Yoshiei; Nozaki, Tsutomu; and Emi, Toshihiko, 4,330,108, Cl. 266-47.000.

Kaup, Edgar L. Utility pole inspection kit. 4,329,882, Cl. 73-864.440.

Kavcic, Marjan, to Schlick -roto-jet Maschinenbau GmbH. Belt for a trough belt cleaning apparatus. 4,329,818, Cl. 51-422.000.

Kawada, Mitsuru: *See*—
Sugihara, Hirosada; Watanabe, Masazumi; Kawada, Mitsuru; and Imada, Isuke, 4,330,554, Cl. 424-285.000.

Kawada, Shigeki: *See*—
Kohzai, Yoshinori; Kawada, Shigeki; and Fujioka, Yoshiki, 4,330,832, Cl. 364-474.000.

Kawai, Mitsuji. Direct air cooling device for the combustion chamber of the internal combustion engine in an automobile. 4,329,969, Cl. 123-585.000.

Kawai, Tohoru, to Canon Kabushiki Kaisha. Lens assembly for enabling change of image position in a camera. 4,330,176, Cl. 350-252.000.

Kawamoto, Tamio, to Nissan Motor Co., Ltd. Transmission for an automobile. 4,329,887, Cl. 74-467.000.

Kawamura, Masato: *See*—
Kinomoto, Shinichi; Kawamura, Masato; and Kobayashi, Susumu, 4,330,718, Cl. 307-118.000.

Kawamura, Tatsuro: *See*—
Shidara, Keiichi; Goto, Naohiro; Kawamura, Tatsuro; Hiruma, Eikyu; Ikeda, Yohitsumu; Tanioka, Kenkichi; Hirai, Tadaaki; Takasaki, Yukio; Kusano, Chushirou; Uda, Tsuyoshi; and Nonaka, Yasuhiko, 4,330,733, Cl. 313-386.000.

Kawasaki, Brian S.: *See*—
Johnson, Derwyn C.; Kawasaki, Brian S.; and Hill, Kenneth O., 4,330,170, Cl. 350-96.160.

Kawasaki Jukogyo Kabushiki Kaisha: *See*—
Fujikawa, Tetsuzo; Seto, Yasuhiro; Yamamoto, Masaru; and Tanaka, Ichiro, 4,329,948, Cl. 123-73.0AA.

Kawasaki Kasei Chemicals Ltd.: *See*—
Segawa, Tomio; and Kuramoto, Sakae, 4,330,470, Cl. 260-245.840.

Kawasaki Steel Corporation: *See*—
Nakanishi, Kyoji; Saito, Kenji; Kato, Yoshiei; Nozaki, Tsutomu; and Emi, Toshihiko, 4,330,108, Cl. 266-47.000.

Kawashima, Syunichiro; Nishida, Masamitsu; Ueda, Ichiro; and Ouchi, Hiromu, to Matsushita Electric Industrial Co., Ltd. Dielectric ceramics. 4,330,631, Cl. 501-139.000.

Kawasumi, Kouichi; Watanabe, Haruo; and Seto, Junetsu, to Sony Corporation. Magnetic recording medium. 4,330,600, Cl. 428-694.000.

Kaye, Alan S.; and Millward, Peter, to United Kingdom Atomic Energy Authority. Circuit for stabilizing an electrical discharge within a glow discharge gas laser. 4,330,762, Cl. 372-85.000.

Kazan, Joseph M.; Sharbaugh, John E.; and Ritz, William C., to Electric Power Research Institute. Seal and bearing arrangement for use in a nuclear reactor. 4,330,370, Cl. 376-200.000.

Kearney & Trecker Corporation: *See*—
Kielma, Ervin J., 4,329,770, Cl. 29-568.000.

Keck, Max H.; Gloth, Richard E.; and Tazuma, James J., to Goodyear Tire & Rubber Company, The. Stabilized polyester composition. 4,330,462, Cl. 524-331.000.

Keith, John C.: *See*—
Miller, Bradley W.; Hickenlooper, Franklin T.; Uhlrich, David C.; Godfrey, Marl D.; Clifford, Douglas M.; James, Rex L.; Watson, Robert E.; Keith, John C.; and Mortensen, Allen C., 4,330,839, Cl. 364-706.000.

Kemeny, George A.; and Gorman, Joseph G., to Westinghouse Electric Corp. Electromagnetic propulsion power system. 4,329,971, Cl. 124-3.000.

Kendall Company, The: *See*—
Schaar, Charles H.; Marra, Nicholas A.; Dunn, William J.; and Villari, Frank K., 4,330,220, Cl. 401-134.000.

Keran, Vitie P.; and Baker, Alan C., to Direct Reduction Corporation, The. Direct reduction rotary kiln with improved air injection. 4,330,325, Cl. 75-36.000.

Kerfoot, Derek G. E.: *See*—
Weir, Donald R.; Kerfoot, Derek G. E.; and Scheie, Hugh C., 4,330,508, Cl. 423-42.000.

Kernforschungsanlage Julich GmbH: *See*—
Boltersdorf, Dagmar; Junginger, Robert; Struck, Bernd D.; and Neumeister, Herbert, 4,330,378, Cl. 204-104.000.

Kernforschungszentrum Karlsruhe Gesellschaft mit beschrankter Haftung: *See*—
Hofmann, Albert; and Schnapper, Christoph, 4,329,849, Cl. 62-55.000.

Kerr, Richard K.: *See*—
Soukup, Charles L.; and Kerr, Richard K., 4,330,038, Cl. 166-267.000.

Kervin, David. Endotracheal-tube stabilizer. 4,329,984, Cl. 128-207.140.

Keshavan, Hampapur R.: *See*—
Abbott, Ned E.; Keshavan, Hampapur R.; and McGuire, Robert J., 4,330,885, Cl. 370-17.000.

Kesling, Peter C. Orthodontic appliance and method for producing occlusion. 4,330,273, Cl. 433-5.000.

Kettler, Douglas L. Aircraft autopilot system. 4,330,827, Cl. 364-428.000.

Keuro Maschinenbau Gesellschaft mit beschrankter Haftung & Kommanditgesellschaft: *See*—
Stolzer, Paul, 4,329,894, Cl. 83-156.000.

Keyes, David G.: *See*—
White, Dwain M.; and Keyes, David G., 4,330,666, Cl. 528-207.000.

Khan, Ehsan U.: *See*—
Hing, Peter; and Khan, Ehsan U., 4,330,629, Cl. 501-47.000.

Khawand, Antoine B. Storage unit for tape cassettes. 4,330,161, Cl. 312-9.000.

Kicherer, Robert: *See*—
Fischer, Karl; Kicherer, Robert; and Mayer, Hans, 4,330,701, Cl. 219-450.000.

Kielma, Ervin J., to Kearney & Trecker Corporation. Automatic tool changer for rotary toolhead with cross-feed tool slide. 4,329,770, Cl. 29-568.000.

Kiene, Wilfried: *See*—
Appel, Eggert; Kiene, Wilfried; and Meier, Dieter, 4,329,879, Cl. 73-861.120.

Kikuchi, Hideo; Kaneko, Tamaki; Ikeda, Sunao; Okuzawa, Tugio; Kakitani, Yohtaro; and Hibi, Kunio, to Ricoh Company, Ltd. Copying machine with collating apparatus. 4,330,200, Cl. 355-24.000.

Killeen, James J.; Plaisance, Thomas H.; and Sekmakas, Kazys, to De Soto, Inc. Chinawood oil-phenolic resin condensates. 4,330,445, Cl. 525-501.500.

Kim, Dae K.: *See*—
Bertolacini, Ralph J.; Kim, Dae K.; and Lehmann, Gerald M., 4,330,435, Cl. 252-455.00Z.

Kim, Yong-Wu: *See*—
Lee, Harvie H.; and Kim, Yong-Wu, 4,330,598, Cl. 428-653.000.

Kimball, Michael E., to Goodyear Tire & Rubber Company, The. Storable flowable polypropylene ether urethane composition. 4,330,454, Cl. 524-773.000.

Kimbara, Hidenori: *See*—
Ikeguchi, Nobuyuki; and Kimbara, Hidenori, 4,330,658, Cl. 528-73.000.

Kimura, Kenji: *See*—
Kato, Toshikazu; Saitou, Sinichi; Watanabe, Seizo; Nishiyama, Toyoo; Shimdda, Misao; Shibata, Tutomu; Kimura, Kenji; and Satoh, Ken, 4,330,802, Cl. 360-96.600.

King, David H.: *See*—
Murphy, Peter; King, David H.; and Haeber, Bernard, 4,330,019, Cl. 144-312.000.

King, John J.; Sellers, Ralph F.; and Castonguay, Richard N., to Ciba-Geigy Corporation. Modified amine hardener systems. 4,330,659, Cl. 528-99.000.

King, Murphy & Associates, Ltd.: *See*—
Murphy, Peter; King, David H.; and Haeber, Bernard, 4,330,019, Cl. 144-312.000.

King, Willis T. Animal restraint device. 4,329,942, Cl. 119-96.000.

Kinomoto, Shinichi; Kawamura, Masato; and Kobayashi, Susumu, to Shinyei Kaisha. Humidity sensor and a humidity detection circuit using the humidity sensor. 4,330,718, Cl. 307-118.000.

Kinoshita, Toshihiro: *See*—
Sakaue, Yoshikazu; Mitsunaga, Tatsuo; and Kinoshita, Toshihiro, 4,329,764, Cl. 29-33.00F.

Kioka, Mamoru; Kitani, Hiroaki; and Kashiwa, Norio, to Mitsui Petrochemical Industries, Ltd. Process for producing olefin polymers or copolymers. 4,330,649, Cl. 526-125.000.

Kirkpatrick, Robert G.; Snyder, Ronald R.; and Sibley, Lincoln L., Jr., to General Electric Company. Gun bolt for high rate of fire revolving battery guns. 4,329,907, Cl. 89-12.000.

Kisfaludy, Lajos: *See*—
Nyeki, Olga; Kisfaludy, Lajos; Karpati, Egon; and Szporny, Laszlo, 4,330,532, Cl. 424-177.000.

Kishimoto, Shinzo: *See*—
Minamizono, Junji; Kishimoto, Shinzo; and Inayama, Takayuki, 4,330,618, Cl. 430-528.000.

Kitani, Hiroaki: *See*—
Kioka, Mamoru; Kitani, Hiroaki; and Kashiwa, Norio, 4,330,649, Cl. 526-125.000.

Kittle, Carl E.; and Price, James L., to Deere & Company. Coupler cover. 4,329,857, Cl. 220-229.000.

Kjaer, Ian; and Mortensen, Niels E., to Skandinavisk Tobakskompagni A/S. Method of producing cheroots and similar tobacco articles and an apparatus for carrying out this method. 4,330,002, Cl. 131-365.000.

Kjarsgaard, Torben. Hose storage apparatus. 4,330,005, Cl. 137-355.280.

Klauke, Erich: *See*—
Marhold, Albrecht; and Klauke, Erich, 4,330,366, Cl. 260-544.00F.

Klein, Dieter: *See*—
Ahner, Stefan; Christ, Richard; Klein, Dieter; and Srostlik, Peter, 4,330,711, Cl. 250-506.000.
Klein, Heinz E. O. Irrigation means and method. 4,330,222, Cl. 405-48.000.
Klein, Wielfried: *See*—
Heimeier, Helmut H.; Klein, Wielfried; Klink, Erich; and Wernicke, Friedrich C., 4,330,853, Cl. 365-227.000.
Kleinerman, Ben. Devices and methods for improving bowling skills. 4,330,123, Cl. 273-54.00B.
Kleinknecht, Hans P.; and Meier, Heinrich, to RCA Corporation. Optical line width measuring apparatus and method. 4,330,213, Cl. 356-355.000.
Klement, Matjas: *See*—
Pietschmann, Frank; John, Gunter; Eistert, Theodor; Noack, Christian; Oliva, Klaus; Zumpe, Bernd; Spaida, Hans P.; Boltizar, Pal; Fabry, Istvan; Vida, Csongor; Lakos, Lajos; and Klement, Matjas, 4,329,832, Cl. 56-98.000.
Kleykamp, Donald L.; and Neroni, Peter J., to Dayco Corporation. Pedestal liner for a railway vehicle and method of making same. 4,330,498, Cl. 264-251.000.
Kline, Evans L.: *See*—
Kang, George S.; Fransen, Lawrence J.; and Kline, Evans L., 4,330,689, Cl. 179-15.55R.
Kling, Adam: *See*—
Treiber, Dieter; Kling, Adam; and Heider, Ulrich, 4,329,921, Cl. 101-93.020.
Klink, Erich: *See*—
Heimeier, Helmut H.; Klein, Wielfried; Klink, Erich; and Wernicke, Friedrich C., 4,330,853, Cl. 365-227.000.
Klippert, Heinz; and Ulmschneider, Dieter, to Hoechst Aktiengesellschaft. Process for the polymerization of vinyl chloride in an aqueous phase. 4,330,653, Cl. 526-200.000.
Klok, Henri. Hydraulic jack and stand combination with key and hinged handle. 4,330,104, Cl. 254-93.00H.
Kluger, Edward W.; and Su, Tien-Kuei, to Milliken Research Corporation. Substituted 1,2-diaminocyclohexanes and use as epoxy curing agents. 4,330,660, Cl. 528-111.000.
Klygis, Mindaugas J., to Illinois Tool Works Inc. Container carrier preform strip. 4,330,058, Cl. 206-150.000.
Kobayashi, Isamu, to Hitachi, Ltd. Multi-function electronic digital watch. 4,330,840, Cl. 364-705.000.
Kobayashi, Susumu: *See*—
Kinomoto, Shinichi; Kawamura, Masato; and Kobayashi, Susumu, 4,330,718, Cl. 307-118.000.
Kobayashi, Tsuneki: *See*—
Miyasaka, Masao; and Kobayashi, Tsuneki, 4,330,219, Cl. 400-690.400.
Kobe Steel, Ltd.: *See*—
Satoh, Yoshiyuki; and Higo, Tomio, 4,330,036, Cl. 165-179.000.
Koboshi, Shigeharu: *See*—
Kurematsu, Masayuki; and Koboshi, Shigeharu, 4,330,616, Cl. 430-376.000.
Kochhar, Rajindar K.: *See*—
Gilbert, Ronald E.; and Kochhar, Rajindar K., 4,330,652, Cl. 526-138.000.
Kockums Industri AB: *See*—
Petersson, Stefan; and Alstad, Sven O., 4,330,249, Cl. 425-329.000.
Koczela, Jeffrey J.: *See*—
Coombs, Peter M.; Playdon, Gary W.; and Koczela, Jeffrey J., 4,330,114, Cl. 271-22.000.
Koenig, Jean J.: *See*—
Jarreau, Francois-Xavier; and Koenig, Jean J., 4,330,544, Cl. 424-248.560.
Koerdt, Hans: *See*—
Jagieniak, Peter; Koerdt, Hans; Bohme, Jochen; Odrich, Dieter; Pochert, Rudolf; and Wiese, Peter, 4,330,700, Cl. 219-121.0PP.
Kogure, Hiroshi: *See*—
Inoue, Kazuo; and Kogure, Hiroshi, 4,329,843, Cl. 60-274.000.
Kohl, Franz: *See*—
Kuhn-Kuhnenfeld, Franz; Kohl, Franz; Nemetz, Friedrich; and Zechmeister, Gerhard, 4,330,361, Cl. 156-617.0SP.
Kohler, Hans-Dieter; and Schleppinghoff, Bernhard, to EC Erdolchemie GmbH. Process for the preparation of alkyl tert.-alkyl ethers. 4,330,679, Cl. 568-697.000.
Kohn, Gary A., to Otis Engineering Corporation. Adjustable pipe union. 4,330,141, Cl. 285-93.000.
Kohzai, Yoshinori; Kawada, Shigeki; and Fujioka, Yoshiki, to Fujitsu Fanuc Limited. Cutter feed rate control system. 4,330,832, Cl. 364-474.000.
Koike, Shoichi, to Nissan Motor Co., Ltd. Window glass movement guide apparatus. 4,329,816, Cl. 49-350.000.
Kojima, Keiichi: *See*—
Miyamoto, Yoshimi; Toriumi, Yasuo; and Kojima, Keiichi, 4,330,493, Cl. 264-22.000.
Kolinger, Kenneth J., to International Harvester Company. Torque limited track pin seal. 4,330,134, Cl. 277-42.000.
Kollodge, Jerome C., to Ball Corporation. Optical tracking device using interlaced images. 4,330,705, Cl. 250-203.00R.
Komatsu, Fumiaki: *See*—
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Komori, Shigehiro; Sakamaki, Hisashi; Hattori, Hiroyuki; Iida, Toshihide; Miyamoto, Koichi; and Umezawa, Kazumi, to Canon Kabushiki Kaisha. Electrophotographic device. 4,330,199, Cl. 355-14.0CH.
Konicek, M. G.: *See*—
Korinek, K. A.; Anderson, R. E.; and Konicek, M. G., 4,330,386, Cl. 204-223.000.
Konig, Hans J.: *See*—
Blumrich, Walter; Dorr, Karl H.; Konig, Hans J.; and Sander, Ulrich, 4,330,364, Cl. 159-47.00R.
Konishi, Hiroo, to Hitachi, Ltd. DC Transmission control system. 4,330,815, Cl. 363-35.000.
Konishi, Jirou; Takasaki, Yasuto; Ohkoshi, Kenji; Ozeki, Akichika; Kajikawa, Shuji; and Itoh, Haruo, to Nippon Kokan Kabushiki Kaisha. Apparatus for manufacturing vitreous slag. 4,330,264, Cl. 432-77.000.
Konishiroku Photo Industry Co., Ltd.: *See*—
Kurematsu, Masayuki; and Koboshi, Shigeharu, 4,330,616, Cl. 430-376.000.
Sato, Shiro, 4,330,179, Cl. 350-422.000.
Kono, Hiroya: *See*—
Nakayama, Shozo; Kato, Kimio; Mukai, Takamitu; Fujii, Tomoo; and Kono, Hiroya, 4,329,913, Cl. 92-71.000.
Koppelman, Edward; and Murray, Robert G., to Koppelman, Edward. Self-cleaning screw conveyor. 4,330,032, Cl. 165-94.000.
Korinek, K. A.; Anderson, R. E.; and Konicek, M. G., to Diamond Shamrock Corporation. Combined ion-exchange particulate bed electrolytic cell. 4,330,386, Cl. 204-223.000.
Kostandov, Leonid A.; Enikolopov, Nikolai S.; Dyachkovsky, Fridrikh S.; Novokshonova, Ljudmila A.; Gavrilov, Jury A.; Kudinova, Olga I.; Maklakova, Tatyana A.; Akopian, Leonid A.; Mchedlov-Petrosian, Otar P.; Boilko, Mikhail I.; Staroselsky, Alexandr A.; and Tkachenko, Vladimir P. Method of producing a composite material. 4,330,573, Cl. 427-213.000.
Kostinko, John A., to J. M. Huber Corporation. Removal of contaminants from zeolite mother liquors. 4,330,518, Cl. 423-329.000.
Kouno, Akiyoshi, to Nippon Electric Co., Ltd. Method for forming an electrostatic latent image. 4,330,607, Cl. 430-48.000.
Kovacs, Gabor: *See*—
Simonidesz, Vilmos; Papp nee Behr, Agnes; Kovacs, Gabor; Ivanics, Jozsef; Der nee Foldvary, Julia; Stadler, Istvan; and Pallagi, Istvan, 4,330,553, Cl. 424-285.000.
Koyama, Hiroshi: *See*—
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Koyama, Masaya; and Hanaoka, Katsuyuki. Multispray system for beauty treatment. 4,330,088, Cl. 239-318.000.
Kraatz, Udo; Buchel, Karl H.; Stetter, Jorg; Frohberger, Paul-Ernst; and Brandes, Wilhelm, to Bayer Aktiengesellschaft. Combatting fungi with triazolylphenacyl pyridyl ether derivatives. 4,330,547, Cl. 424-263.000.
Kraftwerk Union Aktiengesellschaft: *See*—
Eck, Werner; and Hoffmann, Jurgen, 4,330,006, Cl. 137-514.000.
Kranzl, Franz A.; and Springer, Helmut, to Italimpianti Societa' Italiana Impianti p.A. Walking beam furnace. 4,330,262, Cl. 432-3.000.
Krause, Hans P.: *See*—
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Krause, Joachim: *See*—
Eidenschink, Rudolf; Erdmann, Dietrich; Krause, Joachim; and Pohl, Ludwig, 4,330,426, Cl. 252-299.630.
Krause Plow Corporation: *See*—
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Kremheller, Hermann; and Ciesla, Michael, to Ludwig Riedhammer GmbH & Co. KG. Roller hearth furnace for ceramic material. 4,330,268, Cl. 432-246.000.
Krimm, Heinrich; Buysch, Hans-Josef; and Rudolph, Hans, to Bayer Aktiengesellschaft. Process for the preparation of aromatic polycarbonates. 4,330,665, Cl. 528-200.000.
Krueger, Bruno O., to Borden, Inc. Supported silver catalyst and a process of preparing it. 4,330,437, Cl. 252-476.000.
Kruer, Melvin R.: *See*—
Esterowitz, Leon; and Kruer, Melvin R., 4,330,763, Cl. 372-41.000.
Krug, Robert W.: *See*—
Alvarez, Joseph A., III; Bensadon, Joseph M.; Brennen, John F.; and Krug, Robert W., 4,330,857, Cl. 370-104.000.
Kubiak, Glenn D.; and Panish, Morton B., to Bell Telephone Laboratories, Incorporated. Molecular beam deposition technique using gaseous sources of group V elements. 4,330,360, Cl. 156-610.000.
Kubota Ltd.: *See*—
Itani, Seiichi, 4,330,837, Cl. 364-567.000.
Kato, Yasutoshi; and Inui, Nobuo, 4,330,335, Cl. 106-99.000.
Kubota, Yuzuru: *See*—
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Kudinova, Olga I.: *See*—
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Kudora, Dieter: *See*—
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Kuessner, Klaus; Irnich, Rudolf; Scharpenberg, Hans-Georg; and Volkamer, Klaus, to BASF Aktiengesellschaft. Removal of CO_2 and/or H_2S from gases. 4,330,305, Cl. 55-48.000.
Kuhn-Kuhnenfeld, Franz; Kohl, Franz; Nemetz, Friedrich; and Zechmeister, Gerhard, to Wacker-Chemitronic Gesellschaft fur

Elektronic-Grundstoffe mbH. Process for the manufacture of high-purity monocrystals. 4,330,361, Cl. 156-617.0SP.

Kuhnrich, Robert: *See—*
Schade, Gerhard; and Kuhnrich, Robert, 4,330,455, Cl. 523-312.000.

Kuhtreiber, Franz, to Braupatent Universal AG. Means for the production of beer. 4,329,918, Cl. 99-276.000.

Kunimoto, Go; and Mori, Fumio, to Toyo Seikan Kaisha, Ltd. Method to improve wetting of peelable adhesive structures. 4,330,353, Cl. 156-314.000.

Kunz, Walter: *See—*
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Kurafuzi, Takamasa: *See—*
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Kuramoto, Sakae: *See—*
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Kuraray Company, Ltd.: *See—*
Takahashi, Hideo; Igi, Keishiro; Ogawara, Hisashi; and Nakayasu, Haruo, 4,330,459, Cl. 523-148.000.

Kurashiki Boseki Kabushiki Kaisha: *See—*
Saito, Masumi; Hirai, Eiichi; Endo, Masao; and Nishino, Toru, 4,330,589, Cl. 428-312.400.

Kureha Kagaku Kogyo Kabushiki Kaisha: *See—*
Nagai, Hirosi; and Nishimura, Yasushi, 4,330,514, Cl. 423-309.000.
Nishimatsu, Mineaki; Mukai, Sadayoshi; Hayashi, Yoshinori; Yamaguchi, Osamu; Ito, Akira; and Ahiko, Nobuo, 4,330,439, Cl. 252-570.000.

Kurematsu, Masayuki; and Koboshi, Shigeharu, to Konishiroku Photo Industry Co., Ltd. Method for processing silver halide color photographic material. 4,330,616, Cl. 430-376.000.

Kurihara, Mamoru: *See—*
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Kuroda, Toru: *See—*
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Kurt Lachenmeier ApS: *See—*
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Kurtz, Seymour J.: *See—*
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Kurtz, Stuart J.: *See—*
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Kurz, Warren W.; and Lee, J. Kelly, to Eastman Kodak Company. Wound piezoelectric polymer flexure devices. 4,330,730, Cl. 310-331.000.

Kusano, Chushirou: *See—*
Shidara, Keiichi; Goto, Naohiro; Kawamura, Tatsuro; Hiruma, Eikyu; Ikeda, Yohitsumu; Tanioka, Kenkichi; Hirai, Tadaaki; Takasaki, Yukio; Kusano, Chushirou; Uda, Tsuyoshi; and Nonaka, Yasuhiko, 4,330,733, Cl. 313-386.000.

Kuseski, Roger E., to International Business Machines Corporation. Store and forward type of text processing unit. 4,330,847, Cl. 364-900.000.

Kuznetsov, Lev B.; Strelkov, Valentin V.; Zaitsev, Anatoly V.; Lvov, Igor A.; and Romanova, Valentina P. Method for the determination of hydrogen content in inorganic materials. 4,329,868, Cl. 73-19.000.

Kuzunuki, Soshiro: *See—*
Yoneda, Kenji; Nakazato, Masao; Yuminaka, Takeo; Sakata, Kazuhiro; and Kuzunuki, Soshiro, 4,330,838, Cl. 364-580.000.

L. Schuler GmbH: *See—*
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La Telemecanique Electrique: *See—*
Guery, Jean-Pierre; and Roblin, Bernard, 4,330,693, Cl. 200-1.00R.

Labeau, Gary A.: *See—*
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Lachenmeier, Kurt; and Simonson, Peter, to Kurt Lachenmeier ApS. Apparatus for the shrinking of wrapping foils. 4,330,265, Cl. 432-224.000.

LaCroix, James R.: *See—*
Olsen, Everett O.; LaCroix, James R.; and Bowditch, Hoel L., 4,329,775, Cl. 29-602.00A.

Lagofun, Guy J., to Etat Francais represente par le Delegue General pour l'Armement. Electric primer with conductive composition. 4,329,924, Cl. 102-202.800.

L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude: *See—*
Grenier, Maurice; and Petit, Pierre, 4,330,308, Cl. 62-40.000.

Lakos, Lajos: *See—*
Pietschmann, Frank; John, Gunter; Eistert, Theodor; Noack, Christian; Oliva, Klaus; Zumpe, Bernd; Spaida, Hans P.; Boltizar, Pal; Fabry, Istvan; Vida, Csongor; Lakos, Lajos; and Klement, Matjas, 4,329,832, Cl. 56-98.000.

Lakshminarayanasetty, Kadam S.: *See—*
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Lal, Sudarshan; and Porcelli, Richard V., to Atlantic Richfield Company. Process for inhibiting titanium corrosion. 4,330,376, Cl. 204-47.000.

Lamboy, George F.: *See—*
Hastings, Jerome K.; and Lamboy, George F., 4,330,772, Cl. 337-43.000.

LaMont, Romanus M. Adjustable sun visor extender. 4,330,148, Cl. 296-97.00C.

Lancet, Michael S.; Curran, George P.; and Gorin, Everett, to Conoco Inc. Method for producing and regenerating a synthetic CO_2 acceptor. 4,330,430, Cl. 252-420.000.

Lane, John: *See—*
Leonard, James F.; and Lane, John, 4,329,766, Cl. 29-254.000.

Lang, Helmut; and Wollschlegel, Peter. Two-pass heat exchanger. 4,330,034, Cl. 165-113.000.

Larson, Elmer M.; Moody, Edward; and Crosgrove, Robert O., to Electric Power Research Institute, Inc. Cable handling system for use in a nuclear reactor. 4,330,368, Cl. 376-460.000.

Larson, Wayne K.; Lynn, Michael M.; and McAllister, E. Steven, to Minnesota Mining and Manufacturing Company. Process for modifying the surfaces of polyester fibers. 4,330,588, Cl. 428-264.000.

Larsson, Sven A. H., to Industriventilation Produkt AB. Heat pump. 4,329,855, Cl. 62-473.000.

Laudahn, Gerhard: *See—*
Itil, Turan M.; Laudahn, Gerhard; and Herrmann, Werner M., 4,330,538, Cl. 424-238.000.

Laurance, Dale R.: *See—*
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Laurel Bank Machine Co., Ltd.: *See—*
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Laurent, Henry: *See—*
Annen, Klaus; Laurent, Henry; Hofmeister, Helmut; Petzoldt, Karl; and Wiechert, Rudolf, 4,330,541, Cl. 424-243.000.

Lautenschlager, Hans-Heiner; Betzing, Hans; and Stoll, Brigitte, to A. Nattermann & Cie. GmbH. Oxoimidazolinealkanoic acids and their salts and esters, their preparation and pharmaceutical compositions containing them. 4,330,550, Cl. 424-273.00R.

Lautenschlager, Reinhard, to Karl Lautenschlager KG. Over-center hinge, especially for mirrored cabinet doors. 4,329,759, Cl. 16-335.000.

Lavallee, Pierre A., to Xerox Corporation. Multiple mode image processing apparatus and method. 4,330,195, Cl. 355-3.00R.

Lavine, James P.: *See—*
Anagnostopoulos, Constantine N.; Lee, Teh-Hsuang; Burkey, Bruce C.; and Lavine, James P., 4,330,796, Cl. 358-213.000.

Lawenhaupt, Carl S. G., to Aimpoint AB. Photocell controlled power supply circuit for an LED. 4,330,706, Cl. 250-214.0AL.

Lawford, George R.; and Lewis, Peter N., to George Weston Limited. Isolation of microbial protein with reduced nucleic acid content. 4,330,464, Cl. 260-112.00R.

Lawson, Charles A., II, to Westinghouse Electric Corp. Digital display exerciser. 4,330,843, Cl. 364-900.000.

Lax, Benjamin: *See—*
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Lean, Eric G.: *See—*
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Lebas, Jean-Marie; Rat, Pierre; Dupont, Jean-Marcel; and Vinuesa, Germain, to Basset Bretagne Loire-BBL; and Societe National des Poudres et Explosifs. Device for manufacturing articles of compacted powder. 4,330,251, Cl. 425-405.00H.

LeBoeuf, Harry P., to Texaco Inc. Water sampling and disposal apparatus for an offshore operating site. 4,330,402, Cl. 210-170.000.

LeBreton, Albert F., to Westinghouse Electric Corp. System for keying discs to a shaft. 4,330,236, Cl. 416-198.00A.

LeClerc, Gerard: *See—*
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Ledebur, Harry C., to Wean United, Inc. Apparatus for changing rolls in vertical rolling mills. 4,329,864, Cl. 72-239.000.

Lee, Harvie H.; and Kim, Yong-Wu, to Inland Steel Company. Reduction of loss of zinc by vaporization when heating zinc-aluminum coatings on a ferrous metal base. 4,330,598, Cl. 428-653.000.

Lee, J. Kelly: *See—*
Kurz, Warren W.; and Lee, J. Kelly, 4,330,730, Cl. 310-331.000.

Lee, Sam H.: *See—*
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Lee, Teh-Hsuang: *See—*
Anagnostopoulos, Constantine N.; Lee, Teh-Hsuang; Burkey, Bruce C.; and Lavine, James P., 4,330,796, Cl. 358-213.000.

Leedom, Marvin A., to RCA Corporation. Beam guide structure for a flat panel display device. 4,330,735, Cl. 313-422.000.

Legan, Sandra K.; and Dichl, Delores M. Support and restraint apron. 4,330,152, Cl. 297-465.000.

Legrand, Pierre; and Guinard, Pierre, to Freyssinet International (STUP). Apparatus for moulding concrete elements. 4,330,243, Cl. 425-111.000.

Lehmann, Gerald M.: *See—*
Bertolacini, Ralph J.; Kim, Dae K.; and Lehmann, Gerald M., 4,330,435, Cl. 252-455.00Z.

Lehr, Klaus; Heymer, Gero; Stephan, Hans-Werner; and Thummler, Ursus, to Hoechst Aktiengesellschaft. Apparatus for making red phosphorus. 4,330,504, Cl. 422-205.000.

Leichnitz, Kurt, to Dragerwerk Aktiengesellschaft. Test tube construction and method for measuring for nickel aerosols. 4,330,297, Cl. 23-232.00R.

Lemke, James U., to Spin Physics, Inc. Magnetic playback apparatus having immunity to skew. 4,330,807, Cl. 360-119.000.

Lenz, Helmut: *See—*
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Leonard, James F.; and Lane, John. Tool for installing scarifier teeth. 4,329,766, Cl. 29-254.000.
Lerner, Armand; and Lerner, Sylvain S. Sound barrier. 4,330,046, Cl. 181-210.000.
Lerner, Sylvain S.: *See—*
Lerner, Armand; and Lerner, Sylvain S., 4,330,046, Cl. 181-210.000.
Leskovec, Edward V., to Towmotor Corporation. Potentiometer and switch control arrangement. 4,330,007, Cl. 137-565.000.
Lestrade, Catherine: *See—*
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Leuprecht, Hermann: *See—*
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Levenberg, Nat. Adjustable flue control for furnaces. 4,329,967, Cl. 126-293.000.
Lewis, Peter N.: *See—*
Lawford, George R.; and Lewis, Peter N., 4,330,464, Cl. 260-112.00R.
Lewis, Robert E., to New England Nuclear Corporation. Method and system for generating and collecting gallium-68 using alkaline eluant. 4,330,507, Cl. 423-2.000.
Lewis, Roger N.: *See—*
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Li, Choh H., to Hoffmann-La Roche Inc. Novel β-endorphin analogs. 4,330,465, Cl. 260-112.50E.
Liche, Udo: *See—*
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Lieber, Clement E.; Cooper, Robert P.; and Estes, Michael S., to American Hospital Supply Corporation. Catheter with trans-luminal electrical conductor. 4,329,993, Cl. 128-349.00B.
Lieder, Charles A., to Shell Oil Company. Acid gas separation. 4,330,522, Cl. 423-573.00G.
Limburg, William W.; and Pai, Damodar M., to Xerox Corporation. Benzotriazole stabilized photosensitive device. 4,330,608, Cl. 430-59.000.
Lindeman, Charles M.; and Andrew, Ralph D., to Armstrong World Industries, Inc. Asbestos free gasket forming compositions. 4,330,442, Cl. 524-16.000.
Lindemann, Wolfgang, to Sandoz Ltd. Dyeing or printing process. 4,330,293, Cl. 8-495.000.
Lindmayer, Joseph, to Semix Incorporated. Semicrystalline silicon products. 4,330,582, Cl. 428-64.000.
Lindsay Manufacturing Company: *See—*
Siekmeier, David A.; Andersen, Glen L.; Zimmerer, Arthur L., deceased; First National Bank and Trust Company, by, executor; and Zimmerer, William P., 4,330,085, Cl. 239-1.000.
Lindstrom, Olle B. Methods for treating a gas flow containing sulfur oxide. 4,330,512, Cl. 423-244.000.
Linhardt, Hans D.: *See—*
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Linke, Hans-Ralf: *See—*
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Linke, Siegfried; Mardin, Mithat; Krause, Hans P.; and Sitt, Rudiger, to Bayer Aktiengesellschaft. Polyether compounds, their production and their medicinal use. 4,330,677, Cl. 562-583.000.
Lipowski, Stanley A.; and Miskel, John J., Jr., to Diamond Shamrock Corporation. Amphoteric water-in-oil self-inverting polymer emulsion. 4,330,450, Cl. 524-547.000.
Litchfield, William B.; Gent, John T.; and Graham, James A. S., to Rolls-Royce Limited. Coating material. 4,330,575, Cl. 427-376.300.
Liu, Philip J., to Aqua-Chem, Inc. Solar desalting plant. 4,330,373, Cl. 202-174.000.
Lloyd, Max T. Sound generating apparatus. 4,329,905, Cl. 84-411.00R.
Lobl, Herbert: *See—*
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Lockheed Corporation: *See—*
Stovall, Philip H.; and Webber, Robert C., 4,330,571, Cl. 427-120.000.
Lollis, Glen R.; Marler, Marvin G.; Car, Joe P.; and John, Sam J. Method for replacing bolster rings. 4,330,076, Cl. 228-119.000.
LoMaglio, Lewis C., to Ethyl Corporation. Method and apparatus for making collapsible dispensing tubes. 4,330,351, Cl. 156-203.000.
Lombardi, Ronald A.: *See—*
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Long, Robert T.; and Weinhardt, Robert A. Composite insulated wall. 4,329,821, Cl. 52-309.120.
Longhouse, Richard E., to General Motors Corporation. Shroud arrangement for engine cooling fan. 4,329,946, Cl. 123-41.490.
Look: *See—*
Beyl, Jean J. A., 4,330,138, Cl. 280-630.000.
Beyl, Jean J. A., 4,330,228, Cl. 408-112.000.
Looser, Siegfried: *See—*
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Lopez, Claudio: *See—*
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L'Oreal: *See—*
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Bugaut, Andree; Vandenbossche, Jean-Jacques M.; Shahin, Majdi M.; and Kalopissis, Gregoire, 4,330,292, Cl. 8-411.000.
Love, David A., to Beehler, Mockabee, Arant & Jagger. Electronic method and apparatus for modifying musical sound. 4,329,902, Cl. 84-1.250.
Lowe, Colin F. Sheet metal beam. 4,329,824, Cl. 52-634.000.
Lowther, Frank E., to Purification Sciences Inc. Plasma ceramic coating to supply uniform sparking action in combustion engines. 4,330,732, Cl. 313-130.000.
Lucas Industries Limited: *See—*
Seilly, Alec H., 4,329,951, Cl. 123-179.00L.
Woodhouse, Richard G.; and Williams, Malcolm, 4,329,960, Cl. 123-436.000.
Lucas, Robert C., to Etablissements Georges Lucas. Device for coupling in elastic fashion two rotating coaxial pieces, respectively interior and exterior, having a cylindrical interface. 4,329,856, Cl. 464-82.000.
Ludwig Riedhammer GmbH & Co. KG: *See—*
Kremheller, Hermann; and Ciesla, Michael, 4,330,268, Cl. 432-246.000.
Luijerink, Jan H., to Internationale Octrooi Maatschappij "Octropa" B.V. Process of preparing blood cell protein from hemoglobin. 4,330,463, Cl. 260-112.00B.
Lumma, William C., Jr.: *See—*
Baldwin, John J.; and Lumma, William C., Jr., 4,330,543, Cl. 424-248.560.
Lundberg, Robert D.; Phillips, Robert R.; and Duvdevani, Ilan, to Exxon Research & Engineering Co. Thermoplastic elastomeric compositions having improved flow. 4,330,447, Cl. 524-269.000.
Lunden, Richard W.: *See—*
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Lunden, Sidney L. Board feeder for lumber handling systems. 4,330,055, Cl. 198-474.000.
Lundquist, Joseph T., Jr.: *See—*
O'Rell, Dennis D.; Hien, Nguyen V.; Lundquist, Joseph T., Jr.; and Lundsager, Christian B., 4,330,602, Cl. 429-206.000.
Lundsager, Christian B.: *See—*
O'Rell, Dennis D.; Hien, Nguyen V.; Lundquist, Joseph T., Jr.; and Lundsager, Christian B., 4,330,602, Cl. 429-206.000.
Luwa AG: *See—*
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Lvov, Igor A.: *See—*
Kuznetsov, Lev B.; Strelkov, Valentin V.; Zaitsev, Anatoly V.; Lvov, Igor A.; and Romanova, Valentina P., 4,329,868, Cl. 73-19.000.
Lynham, C. Richard, to Foseco Trading A.G. Teapot ladle and method of use. 4,330,107, Cl. 266-44.000.
Lynn, Michael M.: *See—*
Larson, Wayne K.; Lynn, Michael M.; and McAllister, E. Steven, 4,330,588, Cl. 428-264.000.
Lynn, Scott, to University of California, The Regents of the. Method of oxidizing a polyvalent metal. 4,330,478, Cl. 260-439.00R.
Lyons, Bernard J.: *See—*
Horsma, David A.; Lyons, Bernard J.; and Smith-Johannsen, Robert, 4,330,703, Cl. 219-553.000.
M.A.N.-ROLAND Druckmaschinen Aktiengesellschaft: *See—*
Nawrath, Nikolaus, 4,329,922, Cl. 101-248.000.
Maass, Manfred: *See—*
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MacDonald, Angus: *See—*
Oppenheim, Gerd; and MacDonald, Angus, 4,330,203, Cl. 356-127.000.
MacDonald, J. G. Fraser, to Warner Electric Brake & Clutch Company. Amplifying clutch with radially contractible shoe. 4,330,054, Cl. 192-35.000.
Machii, Kenji: *See—*
Arima, Teruo; Machii, Kenji; Chikazawa, Nobumoto; Takeuchi, Tetsuya; and Fujii, Setsuro, 4,330,527, Cl. 424-94.000.
Mackes, Ronald C., to B Q P Industries, Inc. Methods of manufacturing double-flanged window well cover. 4,330,500, Cl. 264-554.000.
Maeda, Shosaku, to Honeywell Inc. Calorimetric apparatus. 4,329,873, Cl. 73-190.0CV.
Maeda, Shosaku, to Honeywell Inc. Calorimetric apparatus. 4,329,874, Cl. 73-190.0CV.
Mager, Louis: *See—*
Ellis, Edward J.; and Mager, Louis, 4,330,383, Cl. 204-159.130.
Maggi, Joseph A.: *See—*
Wilensky, Barry F.; and Maggi, Joseph A., 4,330,779, Cl. 340-705.000.
Maidhof, Georg, to Maidhof GmbH. Clamp connector for vines. 4,329,762, Cl. 24-16.0PB.
Maidhof GmbH: *See—*
Maidhof, Georg, 4,329,762, Cl. 24-16.0PB.
Makar, Harry V.: *See—*
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Maklakova, Tatyana A.: *See—*
Kostandov, Leonid A.; Enikolopov, Nikolai S.; Dyachkovsky, Fridrikh S.; Novokshonova, Ljudmila A.; Gavrilov, Jury A.; Kudinova, Olga I.; Maklakova, Tatyana A.; Akopian, Leonid A.; Mchedlov-Petrosian, Otar P.; Boilko, Mikhail I.; Staroselsky, Alexandr A.; and Tkachenko, Vladimir P., 4,330,573, Cl. 427-213.000.

Malchow, Max E., to RCA Corporation. Arrangement for selectively routing a signal indicative of received signal strength to different portions of a radio receiver in response to different levels of a control signal. 4,330,866, Cl. 455-161.000.

Maldonado, Paul; Eber, Daniele; and Phung, Trung Kiet, to Elfe France. Process for preparation of compositions of bitumen polymers and products. 4,330,449, Cl. 524-68.000.

Malsot, Christian; and Badoz, Jean-Marie, to Socapex. Optical-fiber connector, centering device and method of manufacture of said connector. 4,330,171, Cl. 350-96.210.

Maner, Ronald J.: *See*—
Fleischer, Jean C.; Maner, Ronald J.; and Clark, Gary T., 4,330,467, Cl. 260-155.000.

Mang, Guenter H., to United States of America, Navy. Evaporator tool with remote substrate reorientation mechanism. 4,329,938, Cl. 118-730.000.

Mang, Wilhelm, to Akzona Incorporated. Method for the production of a synthetic crepe yarn. 4,329,841, Cl. 57-288.000.

Manville Service Corporation: *See*—
Graser, Earl J., 4,330,078, Cl. 229-15.000.

Manzke, Klaus D., to U.S. Philips Corporation. Scanning electron microscope. 4,330,707, Cl. 250-311.000.

Mardin, Mithat: *See*—
Linke, Siegfried; Mardin, Mithat; Krause, Hans P.; and Sitt, Rudiger, 4,330,677, Cl. 562-583.000.

Maresca, Joseph A., to Grumman Allied Industries, Inc. Rafter finder. 4,329,783, Cl. 33-169.00R.

Marhold, Albrecht; and Klauke, Erich, to Bayer Aktiengesellschaft. Process for the preparation of halogenated benzoyl fluorides. 4,330,366, Cl. 260-544.00F.

Marino, Salvatore R. Mine conveyor belt man crossover. 4,330,056, Cl. 198-860.000.

Marler, Marvin G.: *See*—
Lollis, Glen R.; Marler, Marvin G.; Car, Joe P.; and John, Sam J., 4,330,076, Cl. 228-119.000.

Maroszyk, Veslav: *See*—
Boehm, Valter; Maroszyk, Veslav; Cieslar, Antonin; Bartuska, Miloslav; Rybak, Karel; Zverina, Karel; and Zelezny, Eduard, 4,330,568, Cl. 427-34.000.

Marra, Nicholas A.: *See*—
Schaar, Charles H.; Marra, Nicholas A.; Dunn, William J.; and Villari, Frank K., 4,330,220, Cl. 401-134.000.

Marshall, LeRoy J., Jr. Inflatable striking member. 4,330,119, Cl. 272-76.000.

Martin, Earl O.: *See*—
Embree, Milton L.; and Martin, Earl O., 4,330,744, Cl. 323-316.000.

Martin, Howard. Endodontic flow-through ultrasonic instrument holder device. 4,330,278, Cl. 433-81.000.

Martinez, James V. Bricklayer's plumb guide. 4,329,786, Cl. 33-409.000.

Martini, Thomas; Erckel, Rudiger; Fruhbeis, Horst; Rosch, Gunter; and Probst, Heinz, to Hoechst Aktiengesellschaft. Mixtures of optical brighteners. 4,330,427, Cl. 252-301.240.

Masaki, Masaru, to Nippon Electric Co., Ltd. Radio paging receiver having pre-recorded voice messages which are selected by address codes and read out responsive to a suffix code. 4,330,780, Cl. 340-825.440.

Masonite AB: *See*—
Thorn, Ake, 4,329,827, Cl. 52-793.000.

Massachusetts Institute of Technology: *See*—
Cohn, Daniel R.; Lax, Benjamin; and Button, Kenneth J., 4,330,761, Cl. 372-4.000.

Masters, John F.: *See*—
Arthur, Robert M.; Triatik, Jerome J.; Guell, Robert M.; and Masters, John F., 4,330,385, Cl. 204-195.00R.

Mastman, Gary J., to National Dispenser Company. Dispenser with side spout for flowable material. 4,330,072, Cl. 222-209.000.

Masuda, Yoshiro: *See*—
Takayama, Yoshihiro; Endo, Fujio; Nozawa, Tsuneo; Masuda, Yoshiro; Mori, Motokuni; and Kanayama, Toshiji, 4,330,533, Cl. 424-181.000.

Mathieu, Bernd, to Dr. Eduard Fresenius, Chemisch-pharmazeutische Industrie KG Apparatebau KG. Separator for an ultracentrifuge. 4,330,080, Cl. 233-27.000.

Matsumoto, Hiroshi: *See*—
Ogata, Masaru; and Matsumoto, Hiroshi, 4,330,472, Cl. 548-567.000.

Matsumoto, Joji; and Hasegawa, Yuji, to Mita Industrial Company Limited. Magnetic brush developing device for electrostatic copying apparatus. 4,330,198, Cl. 355-14.00D.

Matsuoka, Kyoichiro; Irie, Nobuyasu; Inoue, Satoshi; Ito, Katsuto; and Yata, Isao, to Nippon Steel Corporation. Multi-purpose in-line direct heat treating equipment for hot rolled steel wire rod. 4,330,111, Cl. 266-106.000.

Matsushita Electric Industrial Co., Ltd.: *See*—
Kawashima, Syunichiro; Nishida, Masamitsu; Ueda, Ichiro; and Ouchi, Hiromu, 4,330,631, Cl. 501-139.000.
Mori, Kazuhiro; Nakagawa, Hiroshi; Misawa, Yoshihiko; and Mayahara, Kiyoshi, 4,329,776, Cl. 29-741.000.
Obata, Shuichi; Yasuda, Hiroshi; and Fukushima, Yukihiro, 4,330,884, Cl. 369-255.000.
Ohta, Takeo; Akahira, Nobuo; Nakamura, Tatsushi; and Yamashita, Tadaoki, 4,330,883, Cl. 369-100.000.
Tachita, Ryobun; and Fukukita, Hiroshi, 4,330,875, Cl. 367-105.000.
Wada, Ryoichi; Mitsuharu, Tsuchiya; and Takanori, Seno, 4,330,860, Cl. 371-37.000.
Yamaguchi, Isao, 4,330,196, Cl. 355-8.000.

Matsuura, Kazuo; Yamaoka, Noboru; Yanahashi, Shinichi; and Miyoshi, Mituji, to Nippon Oil Company, Ltd. Polymer blend composition for forming polyethylene film. 4,330,639, Cl. 525-240.000.

Mattel, Inc.: *See*—
Rich, Hubert A.; Saffer, Gary M.; and Woolington, John C., 4,329,808, Cl. 46-81.000.

Max-Planck-Gesellschaft zur Foerderung der Wissenschaften E.V.: *See*—
Ruhenstroth-Bauer, Gerhard; and Goldberg, Michel, 4,330,528, Cl. 424-101.000.

May, Adolf; and Voetz, Franz J., to Hoechst Aktiengesellschaft. Highly concentrated filler slurries. 4,330,341, Cl. 106-308.00N.

May, Harold V., to Ervin Industries, Inc. Centrifugal blasting apparatus. 4,329,819, Cl. 51-432.000.

Mayahara, Kiyoshi: *See*—
Mori, Kazuhiro; Nakagawa, Hiroshi; Misawa, Yoshihiko; and Mayahara, Kiyoshi, 4,329,776, Cl. 29-741.000.

Mayer, Hans: *See*—
Fischer, Karl; Kicherer, Robert; and Mayer, Hans, 4,330,701, Cl. 219-450.000.

Mayer, Stephan. Method and apparatus for measuring the length of a thread withdrawn overhead from a thread carrier. 4,330,094, Cl. 242-36.000.

Mayer, Wolfram: *See*—
Wolfers, Heinrich; Mayer, Wolfram; Rudolph, Hans; and Mietzsch, Fritz, 4,330,638, Cl. 525-12.000.

Mayerjak, Robert J., to Currier Piano Company, Inc. Back frame for a piano or the like. 4,329,903, Cl. 84-186.00R.

Maykemper, Alfred: *See*—
Welzel, Josef; Bull, Hans; and Maykemper, Alfred, 4,330,226, Cl. 405-291.000.

Mayor, Colin, to International Computers Limited. Variable delay circuits. 4,330,750, Cl. 328-55.000.

McAllister, E. Steven: *See*—
Larson, Wayne K.; Lynn, Michael M.; and McAllister, E. Steven, 4,330,588, Cl. 428-264.000.

McBryar, Gordon D.: *See*—
Rogers, Thomas D.; Edmons, Rhonda J.; and McBryar, Gordon D., 4,329,987, Cl. 128-214.00R.

MCC Associates: *See*—
Chiang, David, 4,330,739, Cl. 318-696.000.

McCafferty, James, to Swisher Associates. Aerodynamic drag attachment for swung athletic implements. 4,330,121, Cl. 273-26.00B.

McCall, Kenneth E.: *See*—
Coughlin, William J.; Johnson, David E.; and McCall, Kenneth E., 4,330,109, Cl. 266-67.000.

McClaren, Jay L. Grain bin and truck loading and unloading system. 4,330,232, Cl. 414-267.000.

McClure, Charles A., to Crane Co. Aqueous waste treatment. 4,330,408, Cl. 210-619.000.

McCoid, Geraldine L.: *See*—
Glass, Donald R.; and McCoid, Geraldine L., 4,330,014, Cl. 132-89.000.

McCorkle, Kenneth H., Jr.: *See*—
O'Keefe, Dennis R.; McCorkle, Kenneth H., Jr.; and de Graaf, Johannes D., 4,330,374, Cl. 203-12.000.

McCray, William R.: *See*—
Churgovich, Dennis M.; Joest, William F., III; McCray, William R.; and Rutkowski, Edward V., Jr., 4,330,217, Cl. 400-64.000.

McDuff, George G., to United States of America, Energy. Device for detecting imminent failure of high-dielectric stress capacitors. 4,330,777, Cl. 340-635.000.

McGinnes, Paul R.: *See*—
Stout, Daniel W.; and McGinnes, Paul R., 4,330,551, Cl. 424-273.00R.

McGovern, James R. Pendulum switch. 4,330,771, Cl. 335-205.000.

McGuire, Robert J.: *See*—
Abbott, Ned E.; Keshavan, Hampapur R.; and McGuire, Robert J., 4,330,885, Cl. 370-17.000.

Mchedlov-Petrosian, Otar P.: *See*—
Kostandov, Leonid A.; Enikolopov, Nikolai S.; Dyachkovsky, Fridrikh S.; Novokshonova, Ljudmila A.; Gavrilov, Jury A.; Kudinova, Olga I.; Maklakova, Tatyana A.; Akopian, Leonid A.; Mchedlov-Petrosian, Otar P.; Boilko, Mikhail I.; Staroselsky, Alexandr A.; and Tkachenko, Vladimir P., 4,330,573, Cl. 427-213.000.

McMillan, Stephen L., to General Electric Company. Water temperature control system for a clothes washing machine. 4,330,081, Cl. 236-12.00R.

McMullen, James D.: *See*—
Hauck, James P.; Hayes, Cecil L.; and McMullen, James D., 4,330,721, Cl. 307-425.000.

McNaney, Joseph T. Illuminated subject matter image dissecting and elemental light output alignment control means. 4,330,178, Cl. 350-358.000.

Mead Corporation, The: *See*—
Gebhardt, James L.; and Hutchins, Ferris L., Jr., 4,330,102, Cl. 248-459.000.
Wood, Prentice J., 4,330,079, Cl. 229-40.000.

Medici, Salvatore L.: *See*—
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Meier, Dieter: *See*—
Appel, Eggert; Kiene, Wilfried; and Meier, Dieter, 4,329,879, Cl. 73-861.120.

Meier, Heinrich: *See*—
Kleinknecht, Hans P.; and Meier, Heinrich, 4,330,213, Cl. 356-355.000.

Meinholdt, John W. Material engaging apparatus. 4,329,865, Cl. 72-389.000.

Meisburger, William D. Electron lens. 4,330,708, Cl. 250-396.0ML.

Meli, Vincenzo: *See*—
Busacca, Guido; Meli, Vincenzo; and Rossi, Antonio, 4,330,760, Cl. 331-55.000.

Menger-Hammond, Eva L.: *See*—
Yardley, James T.; Rosan, Alan M.; and Menger-Hammond, Eva L., 4,330,382, Cl. 204-157.10R.

Merck & Co., Inc.: *See*—
Baldwin, John J.; and Lumma, William C., Jr., 4,330,543, Cl. 424-248.560.
Karkhanis, Yashwant D., 4,330,623, Cl. 435-68.000.
Tejera, Enrique; Currie, Sara A.; Flor, James E.; and Monaghan, Richard L., 4,330,624, Cl. 435-75.000.

Merck Patent Gesellschaft mit beschrankter Haftung: *See*—
Eidenschink, Rudolf; Erdmann, Dietrich; Krause, Joachim; and Pohl, Ludwig, 4,330,426, Cl. 252-299.630.

Meredith, Brian H., to Australasian Training Aids (Pty.) Ltd. Light duty target support apparatus. 4,330,129, Cl. 273-372.000.

Merger, Franz; and Towae, Friedrich, to BASF Aktiengesellschaft. Thermal decomposition of aryl urethanes. 4,330,479, Cl. 260-453.00P.

Merrell-Toraude et Cie: *See*—
Bey, Philippe; and Jung, Michel, 4,330,559, Cl. 424-319.000.

Messerschmitt-Boelkow-Blohm GmbH: *See*—
Schulz, Ralf-Thilo, 4,329,915, Cl. 92-137.000.

Metallgesellschaft Aktiengesellschaft: *See*—
Blumrich, Walter; Dorr, Karl H.; Konig, Hans J.; and Sander, Ulrich, 4,330,364, Cl. 159-47.00R.
Fennemann, Wolfgang; and Haldorn, Jurgen, 4,330,342, Cl. 134-13.000.

Metzger, Daniel J.: *See*—
Cairns, Donald F.; and Metzger, Daniel J., 4,330,372, Cl. 201-41.000.

Meyer, Richard; and Lee, Sam H., to Amour-Dial, Inc. Pourable, crunchy batter for food products. 4,330,566, Cl. 426-606.000.

Mezoff, Carl R.: *See*—
Wormser, Eric M.; and Mezoff, Carl R., 4,329,978, Cl. 126-417.000.

Michalski, Dennis H., to International Minerals & Chemical Corp. Defluorination of wet process phosphoric acid. 4,330,517, Cl. 423-321.00R.

Michigan Consolidated Gas Company: *See*—
Battah, Husam, 4,330,237, Cl. 417-2.000.

Michl, Rudy; and Willi, Hanspeter, to Etablissement Dentaire Ivoclar. Synthetic dental compositions for production of dental restorations, and dental restorations produced therefrom. 4,330,283, Cl. 433-201.000.

Miedema, Hotze, to Bell Telephone Laboratories, Incorporated. Multipath fade equalizer. 4,330,764, Cl. 333-18.000.

Mietzsch, Fritz: *See*—
Wolfers, Heinrich; Mayer, Wolfram; Rudolph, Hans; and Mietzsch, Fritz, 4,330,638, Cl. 525-12.000.

Mikata, Tsuruo: *See*—
Watanabe, Hiroshi; Mikata, Tsuruo; and Gohda, Kenichi, 4,330,526, Cl. 424-70.000.

Mikulecky, Karel: *See*—
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Miles, Donald L.; and Charles, Harry R., to Chemfil Corporation. Phosphate coating process and composition. 4,330,345, Cl. 148-6.15Z.

Miller, Bradley W.; Hickenlooper, Franklin T.; Uhlrich, David C.; Godfrey, Marl D.; Clifford, Douglas M.; James, Rex L.; Watson, Robert E.; Keith, John C.; and Mortensen, Allen C., to Hewlett-Packard Company. Programmable calculator including means for automatically processing imformation stored on a magnetic record member. 4,330,839, Cl. 364-706.000.

Miller, Charles G.; and Stephens, James B., to Wilson Sales Company, Inc. Curtain for shrouding welding operations. 4,330,177, Cl. 350-311.000.

Miller, Franklyn D.; and Muller, Werner C., to National Distillers & Chemical Corp. Liquefying aqueous starch slurry followed by saccharification with ion exchange resin. 4,330,625, Cl. 435-161.000.

Miller, John C.: *See*—
Harburn, Brian; and Miller, John C., 4,329,862, Cl. 72-53.000.

Miller, John M., to Grumman Aerospace Corporation. Triaxis laser alignment system and method. 4,330,212, Cl. 356-354.000.

Miller, Stephen J., to Chevron Research Company. Cyclic process for upgrading a hydrocarbon or hydrocarbon-forming feed using a ZSM-5 zeolite. 4,330,396, Cl. 208-136.000.

Milliken Research Corporation: *See*—
Kluger, Edward W.; and Su, Tien-Kuei, 4,330,660, Cl. 528-111.000.

Mills, John W. Mix over-run device. 4,329,853, Cl. 62-308.000.

Millward, Peter: *See*—
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Minami, Masana: *See*—
Murakami, Teruo; Yamada, Kiyoshi; and Minami, Masana, 4,330,205, Cl. 356-237.000.

Minamizono, Junji; Kishimoto, Shinzo; and Inayama, Takayuki, to Fuji Photo Film Co., Ltd. Photographic light sensitive material. 4,330,618, Cl. 430-528.000.

Minkiewicz, Andre E.; and Poirier, Norbert, to Compagnie Francaise des Peteroles; and Etudes Petrolieres Marines. Apparatus for automatic welding of bevelled tubes. 4,330,074, Cl. 228-29.000.

Minnesota Mining and Manufacturing Company: *See*—
Boston, David R., 4,330,605, Cl. 430-14.000.
Collins, Philip W., 4,330,357, Cl. 156-584.000.
Larson, Wayne K.; Lynn, Michael M.; and McAllister, E. Steven, 4,330,588, Cl. 428-264.000.
Tesch, Sheila A., 4,330,422, Cl. 252-89.100.
Vesley, George F., 4,330,590, Cl. 428-336.000.

Minowa, Junichiro: *See*—
Fujii, Yohji; and Minowa, Junichiro, 4,330,175, Cl. 350-162.00R.

Minshull, Thomas R., to Greenville Steel Car. Railway car roping staple. 4,329,927, Cl. 105-462.000.

Misawa, Yoshihiko: *See*—
Mori, Kazuhiro; Nakagawa, Hiroshi; Misawa, Yoshihiko; and Mayahara, Kiyoshi, 4,329,776, Cl. 29-741.000.

Miskel, John J., Jr.: *See*—
Lipowski, Stanley A.; and Miskel, John J., Jr., 4,330,450, Cl. 524-547.000.

Mita Industrial Company Limited: *See*—
Matsumoto, Joji; and Hasegawa, Yuji, 4,330,198, Cl. 355-14.00D.

Mitchell, Henry T., Jr. Orientator. 4,330,285, Cl. 434-113.000.

Mitsubishi Denki Kabushiki Kaisha: *See*—
Hatabe, Etsuo; Kato, Masatoshi; Tokugawa, Fumitake; and Nozawa, Toshiharu, 4,330,786, Cl. 346-76.0PH.
Sakaue, Yoshikazu; Mitsunaga, Tatsuo; and Kinoshita, Toshihiro, 4,329,764, Cl. 29-33.00F.

Mitsubishi Gas Chemical Company, Inc.: *See*—
Ikeguchi, Nobuyuki; and Kimbara, Hidenori, 4,330,658, Cl. 528-73.000.
Ikeguchi, Nobuyuki; and Osaki, Yasunori, 4,330,669, Cl. 528-289.000.

Mitsubishi Jukogyo Kabushiki Kaisha: *See*—
Takahashi, Yasuro; and Sakai, Masayasu, 4,329,932, Cl. 110-347.000.

Mitsubishi Paper Mills, Ltd.: *See*—
Ohashi, Minoru; and Iwaosa, Katsuaki, 4,330,617, Cl. 430-405.000.
Yabuta, Kenji; Tosa, Senji; Oiri, Yasuhiko; and Tanaka, Chihaya, 4,330,785, Cl. 346-1.100.

Mitsubishi Petrochemical Co., Ltd.: *See*—
Takayama, Yoshihiro; Endo, Fujio; Nozawa, Tsuneo; Masuda, Yoshiro; Mori, Motokuni; and Kanayama, Toshiji, 4,330,533, Cl. 424-181.000.

Mitsubishi Rayon Co., Ltd.: *See*—
Nishihira, Yoshitaka; and Kato, Harumasa, 4,330,578, Cl. 428-13.000.

Mitsubishi Yuka Pharmaceutical Co., Ltd.: *See*—
Takayama, Yoshihiro; Endo, Fujio; Nozawa, Tsuneo; Masuda, Yoshiro; Mori, Motokuni; and Kanayama, Toshiji, 4,330,533, Cl. 424-181.000.

Mitsuharu, Tsuchiya: *See*—
Wada, Ryoichi; Mitsuharu, Tsuchiya; and Takanori, Seno, 4,330,860, Cl. 371-37.000.

Mitsui Petrochemical Industries, Ltd.: *See*—
Kioka, Mamoru; Kitani, Hiroaki; and Kashiwa, Norio, 4,330,649, Cl. 526-125.000.

Mitsunaga, Tatsuo: *See*—
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Mittnacht, Hans: *See*—
Echte, Adolf; Gausepohl, Hermann; Jenne, Helmut; and Mittnacht, Hans, 4,330,641, Cl. 525-310.000.

Miya, Masayoshi: *See*—
Sakurai, Hisaya; Morita, Hideo; Miya, Masayoshi; Takaya, Katsuhiko; and Yoneda, Haruyuki, 4,330,650, Cl. 526-127.000.

Miyajima, Hajime; and Nakakura, Akio, to Toko, Inc. Surface acoustic wave device. 4,330,767, Cl. 333-150.000.

Miyamoto, Koichi: *See*—
Komori, Shigehiro; Sakamaki, Hisashi; Hattori, Hiroyuki; Iida, Toshihide; Miyamoto, Koichi; and Umezawa, Kazumi, 4,330,199, Cl. 355-14.0CH.

Miyamoto, Satoru; and Yoshida, Takeo, to Hitachi, Ltd. Image pickup tube with mesh electrode support. 4,330,734, Cl. 313-390.000.

Miyamoto, Yoshimi; Toriumi, Yasuo; and Kojima, Keiichi, to Sumitomo Electric Industries, Ltd.; and Nippondenso Co., Ltd. Process for preparing a high voltage ignition cable having low electrostatic capacity. 4,330,493, Cl. 264-22.000.

Miyasaka, Masao; and Kobayashi, Tsuneki, to Hitachi Koki Company, Limited. Upper cover for line printer. 4,330,219, Cl. 400-690.400.

Miyazaki, Kenichi: *See*—
Yokokawa, Sumio; Takanashi, Itsuo; Miyoshi, Tadayoshi; Nakagaki, Shintaro; Motoyama, Koichiro; and Miyazaki, Kenichi, 4,330,797, Cl. 358-224.000.

Miyosawa, Yoshiaki, to Kansai Paint Co., Ltd. Aqueous dispersion for metal coating from colloidal silica, alkoxy silane, and polymer. 4,330,446, Cl. 523-409.000.

Miyoshi, Mituji: *See*—
Matsuura, Kazuo; Yamaoka, Noboru; Yanahashi, Shinichi; and Miyoshi, Mituji, 4,330,639, Cl. 525-240.000.

Miyoshi, Tadayoshi: *See*—
Yokokawa, Sumio; Takanashi, Itsuo; Miyoshi, Tadayoshi; Nakagaki, Shintaro; Motoyama, Koichiro; and Miyazaki, Kenichi, 4,330,797, Cl. 358-224.000.

Mizuno, Yoshio: *See*—
Ohara, Terumi; Mizuno, Yoshio; Iwabuchi, Yoshitaka; and Oketani, Kenzi, 4,330,791, Cl. 358-8.000.

Mizutani, Kiyokazu: *See*—
Ogasawara, Takahisa; and Mizutani, Kiyokazu, 4,330,643, Cl. 525-445.000.

Moberg, Sigurd M., to E. J. Brooks Company. Front entry electric meter locking assembly. 4,329,860, Cl. 70-164.000.

Mobil Oil Corporation: *See*—
Braid, Milton, 4,330,421, Cl. 252-42.700.
Bratton, Robert H., 4,330,872, Cl. 367-43.000.

Mod, William A.: *See*—
Ezzell, Bobby R.; Carl, William P.; and Mod, William A., 4,330,654, Cl. 526-243.000.

Modcom, Inc.: *See*—
Anderson, Roland M., 4,330,271, Cl. 433-3.000.

Moen, Alfred M., to Stanadyne, Inc. Faucet valve with early shutoff. 4,330,011, Cl. 137-625.170.

Mohawk Industries, Inc.: *See*—
Scullin, Richard J., Jr., 4,329,973, Cl. 126-123.000.

Mohr, Russell R. Carburetor. 4,330,492, Cl. 261-145.000.

Molins Limited: *See*—
Hodsall, Brian A., 4,330,001, Cl. 131-108.000.

Mollura Industries: *See*—
Finkelstein, Alberto L., 4,329,748, Cl. 5-451.000.

Momiyama, Kikuo: *See*—
Fujibayashi, Kazuo; and Momiyama, Kikuo, 4,330,188, Cl. 354-200.000.

Monaghan, Kevin J.; Schwickert, Russell C.; and Esposito, John J., to Bunker Ramo Corporation. Optical fiber connector having transversely mateable plug portions. 4,330,172, Cl. 350-96.210.

Monaghan, Richard L.: *See*—
Tejera, Enrique; Currie, Sara A.; Flor, James E.; and Monaghan, Richard L., 4,330,624, Cl. 435-75.000.

Monsanto Company: *See*—
Alexander, Robert E.; and Baugh, Kenneth R., 4,329,763, Cl. 28-104.000.
Bleikamp, Roy H., Jr., 4,330,685, Cl. 174-101.500.
Tokas, Edward F., 4,330,635, Cl. 521-79.000.
Woodbrey, James C., 4,330,587, Cl. 428-215.000.

Montagna, Dominic; and Makar, Harry V., to United States of America, Interior. Method for wrought and cast aluminum separation. 4,330,090, Cl. 241-14.000.

Montagna, Roberto: *See*—
Impallomeni, Enrico; and Montagna, Roberto, 4,330,861, Cl. 375-15.000.

Monteleone, John. Two-speed tuning machine for musical instruments. 4,329,904, Cl. 84-306.000.

Moody, Edward: *See*—
Larson, Elmer M.; Moody, Edward; and Crosgrove, Robert O., 4,330,368, Cl. 376-460.000.

Moore, Chad Z., to Gould Inc. Electrographic recording apparatus employing an improved drive circuit. 4,330,720, Cl. 307-270.000.

Moore, Harold D.: *See*—
Hane, Paul C.; and Moore, Harold D., 4,329,925, Cl. 102-310.000.

Morain, Ronald E.: *See*—
Rawlings, Robert M.; Heim, Derold D.; and Morain, Ronald E., 4,330,191, Cl. 354-345.000.

Moreau, Jean M., to Thomson-CSF. Audio-frequency amplifying device. 4,330,756, Cl. 330-297.000.

Moreau, Pierre A.: *See*—
Christie, Thomas D.; Ballantine, Robert K.; and Moreau, Pierre A., 4,329,939, Cl. 119-28.000.

Morelli, Reno T. Golf putter with removable putting element. 4,330,128, Cl. 273-173.000.

Morgan Actuators, Inc.: *See*—
Hintz, Carmen R., 4,330,725, Cl. 310-82 000.

Mori, Fumio: *See*—
Kunimoto, Go; and Mori, Fumio, 4,330,353, Cl. 156-314.000.

Mori, Kazuhiro; Nakagawa, Hiroshi; Misawa, Yoshihiko; and Mayahara, Kiyoshi, to Matsushita Electric Industrial Co., Ltd. Component inserting apparatus. 4,329,776, Cl. 29-741.000.

Mori, Motokuni: *See*—
Takayama, Yoshihiro; Endo, Fujio; Nozawa, Tsuneo; Masuda, Yoshiro; Mori, Motokuni; and Kanayama, Toshiji, 4,330,533, Cl. 424-181.000.

Morii, Akimitsu: *See*—
Sasaki, Yutaka; Utsumi, Hiroshi; Morii, Akimitsu; and Nakamura, Yoshimi, 4,330,429, Cl. 252-413.000.

Morinaga, Kaoru; and Kurafuzi, Takamasa, to Tokyo Shibaura Denki Kabushiki Kaisha. Tape recorder. 4,330,801, Cl. 360-69.000.

Morita, Hideo: *See*—
Sakurai, Hisaya; Morita, Hideo; Miya, Masayoshi; Takaya, Katsuhiko; and Yoneda, Haruyuki, 4,330,650, Cl. 526-127.000.

Moriyama, Noboru: *See*—
Yamamura, Masaaki; Moriyama, Noboru; and Watanabe, Shin-ichi, 4,330,301, Cl. 44-51.000.

Morris, George Q. Liquid fuel carburetion system. 4,329,964, Cl. 123-557.000.

Morscheck, Timothy J., to Eaton Corporation. Powershift synchronized transmission. 4,329,885, Cl. 74-339.000.

Mortensen, Allen C.: *See*—
Miller, Bradley W.; Hickenlooper, Franklin T.; Uhlrich, David C.; Godfrey, Marl D.; Clifford, Douglas M.; James, Rex L.; Watson, Robert E.; Keith, John C.; and Mortensen, Allen C., 4,330,839, Cl. 364-706.000.

Mortensen, Niels E.: *See*—
Kjaer, Ian; and Mortensen, Niels E., 4,330,002, Cl. 131-365.000.

Mostek Corporation: *See*—
Dean, Ralph T.; Sealer, David A.; and Hellums, James R., 4,330,769, Cl. 333-165.000.

Motorola, Inc.: *See*—
Javeri, Rupin J., 4,329,959, Cl. 123-416.000.
Stulting, Roy M.; and Attwood, Stanley W., 4,330,746, Cl. 324-78.00D.
Swisher, Scott N.; Barnett, Richard E.; and Griner, Paul K., 4,330,758, Cl. 331-1.00A.

Motoyama, Koichiro: *See*—
Yokokawa, Sumio; Takanashi, Itsuo; Miyoshi, Tadayoshi; Nakagaki, Shintaro; Motoyama, Koichiro; and Miyazaki, Kenichi, 4,330,797, Cl. 358-224.000.

Motta, Raimondo, to Oxon Italia S.p.A. Process for obtaining high-purity tricyclohexyl tin hydroxide on a high-yield basis. 4,330,477, Cl. 260-429.700.

Mouri, Shingo; and Koyama, Hiroshi, to Laurel Bank Machine Co., Ltd. Disbursing device in machine for counting paper sheets. 4,330,115, Cl. 271-124.000.

Mowe, Wayne T.: *See*—
Blackmon, Lawrence E.; Dees, John R.; and Mowe, Wayne T., 4,330,591, Cl. 428-369.000.

Mowery, Kenneth D., to General Motors Corporation. Engine spark timing control with added retard and RF signal protection. 4,329,970, Cl. 123-618.000.

Moxham, Peter H., to Imperial Chemical Industries Limited. Oxidation process. 4,330,676, Cl. 562-416.000.

Moyer, Marvin D.: *See*—
Biegesen, David K.; Johnson, Noble M.; Bartlelink, Dirk J.; and Moyer, Marvin D., 4,330,363, Cl. 156-620.000.

Moyer, William A.; and Wood, Robert L., to International Business Machines Corporation. Process for forming a patterned resist mask. 4,330,614, Cl. 430-325.000.

Mrowca, Joseph J., to Du Pont de Nemours, E. I., and Company. Phosphine oxide-substituted pyridazine and pyrazine. 4,330,461, Cl. 524-100.000.

Muenchow, John R.: *See*—
Halle, Reidar; Lewis, Roger N.; and Muenchow, John R., 4,330,495, Cl. 264-54.000.

Mukai, Sadayoshi: *See*—
Nishimatsu, Mineaki; Mukai, Sadayoshi; Hayashi, Yoshinori; Yamaguchi, Osamu; Ito, Akira; and Ahiko, Nobuo, 4,330,439, Cl. 252-570.000.

Mukai, Takamitu: *See*—
Nakayama, Shozo; Kato, Kimio; Mukai, Takamitu; Fujii, Tomoo; and Kono, Hiroya, 4,329,913, Cl. 92-71.000.

Muller, Ralph C.: *See*—
Nolting, Jerry L.; and Muller, Ralph C., 4,329,875, Cl. 73-290.00V.

Muller, Werner C.: *See*—
Miller, Franklyn D.; and Muller, Werner C., 4,330,625, Cl. 435-161.000.

Mulvihill, Mark A.: *See*—
Wreede, John E.; Graube, Andrejs; and Mulvihill, Mark A., 4,330,604, Cl. 430-2.000.

Murakami, Kakuji, to Ricoh Co., Ltd. Method of driving copy material and photosensitive member of copying apparatus. 4,330,194, Cl. 355-3.00R.

Murakami, Susumu: *See*—
Oikawa, Saburo; Murakami, Susumu; and Terasawa, Yoshio, 4,329,772, Cl. 29-571.000.

Murakami, Teruo; Yamada, Kiyoshi; and Minami, Masana, to Tokyo Shibaura Denki Kabushiki Kaisha. Optical apparatus for measuring the size and location of optical in an article. 4,330,205, Cl. 356-237.000.

Muramatsu, Tateo; and Kurihara, Mamoru, to Bridgestone Tire Company Limited. Collapsible rubber dam installation. 4,330,224, Cl. 405-115.000.

Muranaka, Shigeo; and Nakajima, Yasuo, to Nissan Motor Co., Ltd. Combustion chamber of an internal combustion engine. 4,329,955, Cl. 123-260.000.

Murphy, Alan S., to International Business Machines Corp. Graphics display apparatus. 4,330,834, Cl. 364-521.000.

Murphy, Charles R. Wire wrapping tool. 4,329,777, Cl. 29-751.000.

Murphy, Peter; King, David H.; and Haeber, Bernard, to King, Murphy & Associates, Ltd. Method and apparatus for sawing logs into lengths. 4,330,019, Cl. 144-312.000.

Murray, David: *See*—
Dierassi, David; and Murray, David, 4,330,438, Cl. 252-552.000.

Murray, Robert G.: *See*—
Koppelman, Edward; and Murray, Robert G., 4,330,032, Cl. 165-94.000.

Musick, Charles R., to Combustion Engineering, Inc. System and process for the control of a nuclear power system. 4,330,367, Cl. 376-245.000.

Myers, Walter I., to Reliance Electric Company. Vehicle wheel mechanism. 4,330,045, Cl. 180-65.00F.

Naegele, Paul: *See*—
Straub, Ferdinand; Hartmann, Heinrich; Naegele, Paul; and Seib, Karl, 4,330,451, Cl. 524-458.000.

Nagai, Hirosi; and Nishimura, Yasushi, to Kureha Kagaku Kogyo Kabushiki Kaisha. Hydroxyapatite, ceramic material and process for preparing thereof. 4,330,514, Cl. 423-309.000.

Nagami, Akira, to Nippon Electric Co., Ltd. Circuit using insulated-gate field-effect transistors. 4,330,719, Cl. 307-238.300.

Nagano, Masashi, to Shimano Industrial Company Limited. Front derailleur for a bicycle. 4,330,137, Cl. 280-238.000.

Nagano, Masashi, to Shimano Industrial Company Limited. Sprocket for bicycle and the like. 4,330,286, Cl. 474-164.000.

Nagano, Takashi, to Nippon Steel Corporation. Method for heating continuously cast steel slab for production of grain-oriented silicon steel sheet having high magnetic flux density. 4,330,348, Cl. 148-111.000.

Nagase, Hiroshi; Okuyama, Toshiaki; Kubota, Yuzuru; and Suzuki, Katsunori, to Hitachi, Ltd. Electric control apparatus of induction motor. 4,330,741, Cl. 318-803.000.

Nagel, Erich: *See*—
Bartel, Siegfried; Payrhammer, Bernd; and Nagel, Erich, 4,330,096, Cl. 242-74.100.

Nagira, Norichika: *See*—
Toshimitsu, Tohoru; Nagira, Norichika; and Ueda, Kenji, 4,330,112, Cl. 266-115.000.

Nagley, Bruce K. Typing copy stand. 4,329,799, Cl. 40-352.000.

Naimpally, Saiprasad V., to RCA Corporation. Video blanking circuit with controlled rate of unblanking. 4,330,792, Cl. 358-33.000.

Nakagaki, Shintaro: *See*—
Yokokawa, Sumio; Takanashi, Itsuo; Miyoshi, Tadayoshi; Nakagaki, Shintaro; Motoyama, Koichiro; and Miyazaki, Kenichi, 4,330,797, Cl. 358-224.000.

Nakagawa, Hiroshi: *See*—
Mori, Kazuhiro; Nakagawa, Hiroshi; Misawa, Yoshihiko; and Mayahara, Kiyoshi, 4,329,776, Cl. 29-741.000.

Nakagawa, Shigesaburo, to Nakawa Corporation. Method for manufacturing a spring ring to be electroplated. 4,329,765, Cl. 29-160.600.

Nakagawa, Tadashi, to Seiko Koki Kabushiki Kaisha. Self-timer for automatic focusing camera. 4,330,187, Cl. 354-195.000.

Nakajima, Yasuo: *See*—
Muranaka, Shigeo; and Nakajima, Yasuo, 4,329,955, Cl. 123-260.000.

Nakakura, Akio: *See*—
Miyajima, Hajime; and Nakakura, Akio, 4,330,767, Cl. 333-150.000.

Nakamura, Norihiko: *See*—
Ito, Takaaki; and Nakamura, Norihiko, 4,330,489, Cl. 261-44.00C.

Nakamura, Seiichi, to Citizen Watch Co., Ltd. Sound producing device for watches. 4,330,878, Cl. 368-250.000.

Nakamura, Shigeo: *See*—
Imazeki, Ryoji; Hattori, Masayuki; and Nakamura, Shigeo, 4,330,816, Cl. 363-56.000.

Nakamura, Tatsushi: *See*—
Ohta, Takeo; Akahira, Nobuo; Nakamura, Tatsushi; and Yamashita, Tadaoki, 4,330,883, Cl. 369-100.000.

Nakamura, Yoshimi: *See*—
Sasaki, Yutaka; Utsumi, Hiroshi; Morii, Akimitsu; and Nakamura, Yoshimi, 4,330,429, Cl. 252-413.000.

Nakanishi, Kyoji; Saito, Kenji; Kato, Yoshiei; Nozaki, Tsutomu; and Emi, Toshihiko, to Kawasaki Steel Corporation. Method for cooling tuyeres. 4,330,108, Cl. 266-47.000.

Nakawa Corporation: *See*—
Nakagawa, Shigesaburo, 4,329,765, Cl. 29-160.600.

Nakayama, Shozo; Kato, Kimio; Mukai, Takamitu; Fujii, Tomoo; and Kono, Hiroya, to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho. Structure of a shoe for a swash plate type compressor. 4,329,913, Cl. 92-71.000.

Nakayasu, Haruo: *See*—
Takahashi, Hideo; Igi, Keishiro; Ogawara, Hisashi; and Nakayasu, Haruo, 4,330,459, Cl. 523-148.000.

Nakazato, Masao: *See*—
Yoneda, Kenji; Nakazato, Masao; Yuminaka, Takeo; Sakata, Kazuhiro; and Kuzunuki, Soshiro, 4,330,838, Cl. 364-580.000.

Narasimhan, Mandayam, to Allied Corporation. Method of making strips of metallic glasses containing embedded particulate matter. 4,330,027, Cl. 164-461.000.

Nash, John E., to Syntex (U.S.A.) Inc. Rotor driven vibratory device having rotor centralization means and vibrational mode selection means associated therewith. 4,330,282, Cl. 433-118.000.

Nassar, Abdalla E., to CHB Foods, Inc. Intermediate moisture stabilized chunky food product and method. 4,330,562, Cl. 426-310.000.

Nasu, Kohji: *See*—
Tanaka, Michio; Nasu, Kohji; and Kanemoto, Tetsuaki, 4,330,595, Cl. 428-425.500.

National Chemical Products Limited: *See*—
Job, John L.; and Shaw, Peter S., 4,330,667, Cl. 528-266.000.

National Dispenser Company: *See*—
Mastman, Gary J., 4,330,072, Cl. 222-209.000.

National Distillers & Chemical Corp.: *See*—
Miller, Franklyn D.; and Muller, Werner C., 4,330,625, Cl. 435-161.000.

National Institute for Metallurgy: *See*—
Verbaan, Bernard, 4,330,379, Cl. 204-119.000.

National Research Development Corporation: *See*—
England, Eric H., 4,329,779, Cl. 29-840.000.

National Semiconductor Corporation: *See*—
Burns, Carmen D., 4,330,790, Cl. 357-70.000.

National Starch and Chemical Corporation: *See*—
Tessler, Martin M., 4,330,365, Cl. 162-168.0NA.

National Steel Corporation: *See*—
Cairns, Donald F.; and Metzger, Daniel J., 4,330,372, Cl. 201-41.000.

Nawrath, Nikolaus, to M.A.N.-ROLAND Druckmaschinen Aktiengesellschaft. Printing machine cylinder shaft attachment arrangement. 4,329,922, Cl. 101-248.000.

NCR Corporation: *See*—
Gulett, Michael R.; Trudel, Murray L.; and Stewart, John K., Jr., 4,330,569, Cl. 427-38.000.

Neder, Gunter: *See*—
Stolz, Robert; and Neder, Gunter, 4,330,160, Cl. 308-201.000.

Nehring, Rudolf, to Chemische Werke Huels, A.G. Process for the manufacture of cyclic acetals of aliphatic aldehydes. 4,330,474, Cl. 549-367.000.

Nelson, Frederick J.; Richards, Raymond S.; and Rough, Robert R., Sr., to Owens-Illinois, Inc. Method and apparatus for preheating pulverous materials prior to their introduction into a melting furnace. 4,330,315, Cl. 65-27.000.

Nelson, Richard E. Articulating frame press. 4,329,867, Cl. 72-455.000.

Nelson, Robert A.: *See*—
Hoffend, Thomas R.; and Nelson, Robert A., 4,330,460, Cl. 524-849.000.

Nelson, Theodore W., Jr.; Corkle, David B.; Wolfe, Joel Z.; and Ganzel, Larry A., to Peter F. Loftus Corporation (Illinois). Treatment of blast furnace off-gas. 4,330,511, Cl. 423-210.000.

Nemetz, Friedrich: *See*—
Kuhn-Kuhnenfeld, Franz; Kohl, Franz; Nemetz, Friedrich; and Zechmeister, Gerhard, 4,330,361, Cl. 156-617.0SP.

Nemoto, Kaoru; Ogasawara, Toshichika; and Besaho, Sadao, to Chugai Seiyaku Kabushiki Kaisha. Colored gelatin covering. 4,330,561, Cl. 426-140.000.

Neroni, Peter J.: *See*—
Kleykamp, Donald L.; and Neroni, Peter J., 4,330,498, Cl. 264-251.000.

Netti, James. Running or jogging exercising glove. 4,330,120, Cl. 272-119.000.

Neumeier, Paul, to O.K. Partnership. Machine-retrievable card and card retrieval apparatus and method therefor. 4,330,063, Cl. 209-608.000.

Neumeister, Herbert: *See*—
Boltersdorf, Dagmar; Junginger, Robert; Struck, Bernd D.; and Neumeister, Herbert, 4,330,378, Cl. 204-104.000.

New England Nuclear Corporation: *See*—
Lewis, Robert E., 4,330,507, Cl. 423-2.000.

New York Blood Center, Inc.: *See*—
Goldstein, Jack, 4,330,619, Cl. 435-2.000.

Newman, John O. H., to Coal Industry (Patents) Limited. Quenching process. 4,330,394, Cl. 208-23.000.

Newsome, John R. Bundling mechanism for signatures. 4,330,116, Cl. 271-178.000.

Newton, William A. Droplet exploding and freezing apparatus and method. 4,329,787, Cl. 34-1.000.

Neyhart, James H.; Brown, George A.; Relyea, Lloyd A.; Scharfe, Merlin E.; and Pinsler, Heinz W., to Xerox Corporation. Method of imaging a trapping layer overcoated inorganic photoresponsive device. 4,330,609, Cl. 430-126.000.

Nicator Aktiebolag: *See*—
Bjork, Bengt A., 4,329,784, Cl. 33-180.0AT.

Nichols, Robert L. Composite die for forming a plunger for use in a shutoff valve for a medical suction apparatus. 4,330,253, Cl. 425-437.000.

Niitti, Timo U., to Outokumpu Oy. Method for continual replacement of the rubber lining in a rotating mill. 4,329,767, Cl. 29-402.080.

Nikelat, Lothar. Data deletion device for magnetic tapes. 4,330,800, Cl. 360-66.000.

Niki, Motohiro. Water dispenser for small animals. 4,329,941, Cl. 119-72.500.

Nimerick, Kenneth H., to Dow Chemical Company, The. Lower alkanoic acid derivatives of a diethanolamine/fatty acid condensate. 4,330,339, Cl. 106-243.000.

Nippon Electric Co., Ltd.: *See*—
Fukaya, Hirokazu; and Togari, Hisashi, 4,330,757, Cl. 330-298.000.
Kouno, Akiyoshi, 4,330,607, Cl. 430-48.000.
Masaki, Masaru, 4,330,780, Cl. 340-825.440.
Nagami, Akira, 4,330,719, Cl. 307-238.300.
Takada, Masami, 4,330,859, Cl. 370-113.000.

Nippon Hoso Kyokai: *See*—
Shidara, Keiichi; Goto, Naohiro; Kawamura, Tatsuro; Hiruma, Eikyu; Ikeda, Yohitsumu; Tanioka, Kenkichi; Hirai, Tadaaki; Takasaki, Yukio; Kusano, Chushirou; Uda, Tsuyoshi; and Nonaka, Yasuhiko, 4,330,733, Cl. 313-386.000.
Yabuta, Kenji; Tosa, Senji; Oiri, Yasuhiko; and Tanaka, Chihaya, 4,330,785, Cl. 346-1.100.

Nippon Kogaku K.K.: *See*—
Hashimoto, Noriyoshi; Ito, Mikio; and Tamura, Kikuo, 4,330,209, Cl. 356-328.000.
Hashimoto, Noriyoshi; Ito, Mikio; and Tamura, Kikuo, 4,330,210, Cl. 356-328.000.

Nippon Kokan Kabushiki Kaisha: *See*—
Konishi, Jirou; Takasaki, Yasuto; Ohkoshi, Kenji; Ozeki, Akichika; Kajikawa, Shuji; and Itoh, Haruo, 4,330,264, Cl. 432-77.000.

Nippon Oil Company, Ltd.: *See*—
Matsuura, Kazuo; Yamaoka, Noboru; Yanahashi, Shinichi; and Miyoshi, Mituji, 4,330,639, Cl. 525-240.000.

Nippon Steel Corporation: *See*—
Matsuoka, Kyoichiro; Irie, Nobuyasu; Inoue, Satoshi; Ito, Katsuto; and Yata, Isao, 4,330,111, Cl. 266-106.000.
Nagano, Takashi, 4,330,348, Cl. 148-111.000.
Toshimitsu, Tohoru; Nagira, Norichika; and Ueda, Kenji, 4,330,112, Cl. 266-115.000.
Nippon Telegraph & Telephone Public Corporation: *See*—
Fujii, Yohji; and Minowa, Junichiro, 4,330,175, Cl. 350-162.00R.
Fujiwara, Koichi; Yamauchi, Goro; Arita, Kishio; and Tsurumi, Shigeyuki, 4,330,331, Cl. 148-2.000.
Yamada, Hazime; and Ishida, Akira, 4,330,841, Cl. 364-784.000.
Nippon Zeon Co., Ltd.: *See*—
Iwata, Riso, 4,330,448, Cl. 526-79.000.
Nippondenso Co., Ltd.: *See*—
Miyamoto, Yoshimi; Toriumi, Yasuo; and Kojima, Keiichi, 4,330,493, Cl. 264-22.000.
Yano, Kiyotosi; Ishikawa, Eizi; and Yoshiyama, Shigeru, 4,330,004, Cl. 137-343.000.
Nishida, Masamitsu: *See*—
Kawashima, Syunichiro; Nishida, Masamitsu; Ueda, Ichiro; and Ouchi, Hiromu, 4,330,631, Cl. 501-139.000.
Nishida, Minoru: *See*—
Imanaka, Hiroshi; and Nishida, Minoru, 4,330,529, Cl. 424-114.000.
Nishihira, Yoshitaka; and Kato, Harumasa, to Mitsubishi Rayon Co., Ltd. Synthetic resin decorative article and process for producing same. 4,330,578, Cl. 428-13.000.
Nishimatsu, Mineaki; Mukai, Sadayoshi; Hayashi, Yoshinori; Yamaguchi, Osamu; Ito, Akira; and Ahiko, Nobuo, to Kureha Kagaku Kogyo Kabushiki Kaisha; and Nissin Electric Co., Ltd. Electric device comprising impregnated insulating materials and electric elements. 4,330,439, Cl. 252-570.000.
Nishimatsu, Shigeru: *See*—
Okudaira, Sadayuki; Suzuki, Keizo; Nishimatsu, Shigeru; and Kanomata, Ichiro, 4,330,384, Cl. 204-192.00E.
Nishimura, Yasushi: *See*—
Nagai, Hirosi; and Nishimura, Yasushi, 4,330,514, Cl. 423-309.000.
Nishino, Toru: *See*—
Saito, Masumi; Hirai, Eiichi; Endo, Masao; and Nishino, Toru, 4,330,589, Cl. 428-312.400.
Nishiyama, Toyoo: *See*—
Kato, Toshikazu; Saitou, Sinichi; Watanabe, Seizo; Nishiyama, Toyoo; Shimdda, Misao; Shibata, Tutomu; Kimura, Kenji; and Satoh, Ken, 4,330,802, Cl. 360-96.600.
Nissan Motor Co., Ltd.: *See*—
Hashimoto, Atsumi; and Takagi, Kazumasa, 4,330,782, Cl. 343-715.000.
Hirota, Toshio, 4,329,944, Cl. 123-3.000.
Ishikawa, Yoshikazu; and Honma, Masayuki, 4,329,968, Cl. 123-573.000.
Kawamoto, Tamio, 4,329,887, Cl. 74-467.000.
Koike, Shoichi, 4,329,816, Cl. 49-350.000.
Muranaka, Shigeo; and Nakajima, Yasuo, 4,329,955, Cl. 123-260.000.
Satoh, Seikoh; and Suzuki, Tadashi, 4,330,017, Cl. 138-126.000.
Nissin Electric Co., Ltd.: *See*—
Nishimatsu, Mineaki; Mukai, Sadayoshi; Hayashi, Yoshinori; Yamaguchi, Osamu; Ito, Akira; and Ahiko, Nobuo, 4,330,439, Cl. 252-570.000.
Nittetsu Plant Designing Corporation: *See*—
Toshimitsu, Tohoru; Nagira, Norichika; and Ueda, Kenji, 4,330,112, Cl. 266-115.000.
Nitto Chemical Industry Co., Ltd.: *See*—
Sasaki, Yutaka; Utsumi, Hiroshi; Morii, Akimitsu; and Nakamura, Yoshimi, 4,330,429, Cl. 252-413.000.
NL Industries, Inc.: *See*—
Hoover, Lonnie D., 4,330,414, Cl. 252-8.50A.
Noack, Christian: *See*—
Pietschmann, Frank; John, Gunter; Eistert, Theodor; Noack, Christian; Oliva, Klaus; Zumpe, Bernd; Spaida, Hans P.; Boltizar, Pal; Fabry, Istvan; Vida, Csongor; Lakos, Lajos; and Klement, Matjas, 4,329,832, Cl. 56-98.000.
Noakes, Michael L.: *See*—
Cairns, James A.; Antill, John E.; and Noakes, Michael L., 4,330,436, Cl. 252-466.00J.
Nogami, Taro; and Hirose, Hiroshi, to Hitachi, Ltd. Fluorescence spectrophotometer. 4,330,207, Cl. 356-318.000.
Nolen, Herbert J. Locking bar for doors from the inside of dwellings. 4,330,147, Cl. 292-259.00R.
Noll, Burton A.; and Suhey, Richard P., to Corning Glass Works. Mounting device for heat recovery wheels. 4,330,029, Cl. 165-8.000.
Nolting, Jerry L.; and Muller, Ralph C., to Texaco Inc. Ultra sensitive liquid level detector and method. 4,329,875, Cl. 73-290.00V.
Nomura, Katsumi: *See*—
Yamazaki, Kazuo; Nomura, Katsumi; and Takemoto, Osafumi, 4,330,778, Cl. 340-642.000.
Nonaka, Yasuhiko: *See*—
Shidara, Keiichi; Goto, Naohiro; Kawamura, Tatsuro; Hiruma, Eikyu; Ikeda, Yohitsumu; Tanioka, Kenkichi; Hirai, Tadaaki; Takasaki, Yukio; Kusano, Chushirou; Uda, Tsuyoshi; and Nonaka, Yasuhiko, 4,330,733, Cl. 313-386.000.
Norio, Akimoto: *See*—
Hideo, Sato; Teruo, Takiguchi; Norio, Akimoto; and Ikuo, Ueno, 4,330,668, Cl. 528-271.000.
Norlin Industries, Inc.: *See*—
Swain, Richard, 4,330,751, Cl. 328-61.000.
North Star Company, Inc.: *See*—
Coulson, Don J., 4,329,811, Cl. 47-46.000.
Northern Telecom Limited: *See*—
Botros, Radamis, 4,330,690, Cl. 179-81.00A.
Nosker, Richard W., to RCA Corporation. Video disc apparatus for clearing foreign matter from the signal pickup stylus during playback. 4,330,881, Cl. 369-50.000.
Novak, Milan, to Her Majesty the Queen in Right of Ontario as represented by the Minister of Natural Resources. Humane animal trap. 4,329,805, Cl. 43-87.000.
Novokshonova, Ljudmila A.: *See*—
Kostandov, Leonid A.; Enikolopov, Nikolai S.; Dyachkovsky, Fridrikh S.; Novokshonova, Ljudmila A.; Gavrilov, Jury A.; Kudinova, Olga I.; Maklakova, Tatyana A.; Akopian, Leonid A.; Mchedlov-Petrosian, Otar P.; Boilko, Mikhail I.; Staroselsky, Alexandr A.; and Tkachenko, Vladimir P., 4,330,573, Cl. 427-213.000.
Nozaki, Masao: *See*—
Iwabuchi, Yoshitaka; and Nozaki, Masao, 4,330,806, Cl. 360-106.000.
Nozaki, Tsutomu: *See*—
Nakanishi, Kyoji; Saito, Kenji; Kato, Yoshiei; Nozaki, Tsutomu; and Emi, Toshihiko, 4,330,108, Cl. 266-47.000.
Nozawa, Toshiharu: *See*—
Hatabe, Etsuo; Kato, Masatoshi; Tokugawa, Fumitake; and Nozawa, Toshiharu, 4,330,786, Cl. 346-76.0PH.
Nozawa, Tsuneo: *See*—
Takayama, Yoshihiro; Endo, Fujio; Nozawa, Tsuneo; Masuda, Yoshiro; Mori, Motokuni; and Kanayama, Toshiji, 4,330,533, Cl. 424-181.000.
Nuclear Power Company Limited: *See*—
Hyde, Eric A.; Goldsmith, Hugh A.; and Proudlove, Michael J., 4,330,865, Cl. 376-249.000.
Nyeki, Olga; Kisfaludy, Lajos; Karpati, Egon; and Szporny, Laszlo, to Richter Gedeon Vegyeszeti Gyar Rt. Angiotensin-II analogues with antagonizing effects, containing an α-hydroxycarboxylic acid residue in position 8, and a process for the preparation thereof. 4,330,532, Cl. 424-177.000.
Nysted, Leonard N., to Duraclean International. Nozzle and method for generating foam. 4,330,086, Cl. 239-8.000.
O.K. Partnership: *See*—
Neumeier, Paul, 4,330,063, Cl. 209-608.000.
Obata, Shuichi; Yasuda, Hiroshi; and Fukushima, Yukihiro, to Matsushita Electric Industrial Co., Ltd. Pickup arm device. 4,330,884, Cl. 369-255.000.
Occidental Research Corporation: *See*—
Di Giacomo, Peter M.; and Park, Won C., 4,330,153, Cl. 299-1.000.
Odrich, Dieter: *See*—
Jagieniak, Peter; Koerdt, Hans; Bohme, Jochen; Odrich, Dieter; Pochert, Rudolf; and Wiese, Peter, 4,330,700, Cl. 219-121.0PP.
Oestreich, Ulrich, to Siemens Aktiengesellschaft. Conductor for optical cables. 4,330,173, Cl. 350-96.230.
Offerman, Michael: *See*—
Pittman, Robert B.; Wescott, Ronald O.; and Offerman, Michael, 4,330,164, Cl. 339-49.00R.
Ogasawara, Takahisa; and Mizutani, Kiyokazu, to Toagosei Chemical Industry Co., Ltd. Process for production of acryloyloxy- or methacryloyloxy-terminated polyesters. 4,330,643, Cl. 525-445.000.
Ogasawara, Toshichika: *See*—
Nemoto, Kaoru; Ogasawara, Toshichika; and Bessho, Sadao, 4,330,561, Cl. 426-140.000.
Ogata, Masaru; and Matsumoto, Hiroshi, to Shionogi & Co., Ltd. Meta-sulfonamido-benzamide derivatives. 4,330,472, Cl. 548-567.000.
Ogawa, Akira, to Kabushiki Kaisha Tokai Rika Denki Seisakusho. Complex switch assembly. 4,330,694, Cl. 200-6.00A.
Ogawara, Hisashi: *See*—
Takahashi, Hideo; Igi, Keishiro; Ogawara, Hisashi; and Nakayasu, Haruo, 4,330,459, Cl. 523-148.000.
Oh-hashi, Fujiko: *See*—
Sakurai, Yoshio; Kataoka, Tateshi; and Oh-hashi, Fujiko, 4,330,534, Cl. 424-182.000.
Ohara, Terumi; Mizuno, Yoshio; Iwabuchi, Yoshitaka; and Oketani, Kenzi, to Victor Company of Japan, Ltd. System for processing television video signals reproduced from a recording medium in special reproduction mode into signals for performing normal interlacing. 4,330,791, Cl. 358-8.000.
Ohashi, Minoru; and Iwaosa, Katsuaki, to Mitsubishi Paper Mills, Ltd. Photographic elements containing novel developing agent precursors. 4,330,617, Cl. 430-405.000.
Ohkoshi, Kenji: *See*—
Konishi, Jirou; Takasaki, Yasuto; Ohkoshi, Kenji; Ozeki, Akichika; Kajikawa, Shuji; and Itoh, Haruo, 4,330,264, Cl. 432-77.000.
Ohlson, Gustav O. I., to AB Tranas Rostfria. Dispensing device for discharging a liquid or pasty product from a container, containing such a product. 4,330,071, Cl. 222-207.000.
Ohta, Takeo; Akahira, Nobuo; Nakamura, Tatsushi; and Yamashita, Tadaoki, to Matsushita Electric Industrial Co., Ltd. System and method of optical information storage in a recording disc. 4,330,883, Cl. 369-100.000.
Ohyabu, Nobuyoshi, to General Atomic Company. Double layer field shaping systems for toroidal plasmas. 4,330,864, Cl. 376-133.000.
Oikawa, Saburo; Murakami, Susumu; and Terasawa, Yoshio, to Hitachi, Ltd. Method for manufacturing a semiconductor device utilizing selective epitaxial growth and post heat treating. 4,329,772, Cl. 29-571.000.

Oiri, Yasuhiko: *See—*
Yabuta, Kenji; Tosa, Senji; Oiri, Yasuhiko; and Tanaka, Chihaya, 4,330,785, Cl. 346-1.100.
Okada, Sadayuki; and Sonobe, Hisao, to Hitachi, Ltd. Constant pressure type ebullient cooling equipment. 4,330,033, Cl. 165-104.270.
Okazaki, Shizuo, to Tokyo Shibaura Denki Kabushiki Kaisha. Automatic dehydrator. 4,329,858, Cl. 68-12.00R.
O'Keefe, Dennis R.; McCorkle, Kenneth H., Jr.; and de Graaf, Johannes D., to General Atomic Company. Recovery of anhydrous hydrogen iodide. 4,330,374, Cl. 203-12.000.
Oketani, Kenzi: *See—*
Ohara, Terumi; Mizuno, Yoshio; Iwabuchi, Yoshitaka; and Oketani, Kenzi, 4,330,791, Cl. 358-8.000.
Okudaira, Sadao, to Asahi Kogaku Kogyo Kabushiki Kaisha. Compact zoom lens. 4,330,181, Cl. 350-427.000.
Okudaira, Sadayuki; Suzuki, Keizo; Nishimatsu, Shigeru; and Kanomata, Ichiro, to Hitachi, Ltd. Process for plasma etching. 4,330,384, Cl. 204-192.00E.
Okuyama, Toshiaki: *See—*
Nagase, Hiroshi; Okuyama, Toshiaki; Kubota, Yuzuru; and Suzuki, Katsunori, 4,330,741, Cl. 318-803.000.
Okuzawa, Tugio: *See—*
Kikuchi, Hideo; Kaneko, Tamaki; Ikeda, Sunao; Okuzawa, Tugio; Kakitani, Yohtaro; and Hibi, Kunio, 4,330,200, Cl. 355-24.000.
Olin Corporation: *See—*
Pryor, Michael J.; and Winter, Joseph, 4,329,863, Cl. 72-205.000.
Pryor, Michael J., 4,330,327, Cl. 75-76.000.
Shermer, David A.; Jim, Parsons P.; and Laurance, Dale R., 4,330,407, Cl. 210-602.000.
Tyler, Derek E.; Cheskis, Harvey P.; Stone, Louis P.; and Pryor, Michael J., 4,330,328, Cl. 75-76.000.
Winter, Joseph; Brenneman, William; and Fister, Julius C., 4,330,599, Cl. 428-675.000.
Oliva, Klaus: *See—*
Pietschmann, Frank; John, Gunter; Eistert, Theodor; Noack, Christian; Oliva, Klaus; Zumpe, Bernd; Spaida, Hans P.; Boltizar, Pal; Fabry, Istvan; Vida, Csongor; Lakos, Lajos; and Klement, Matjas, 4,329,832, Cl. 56-98.000.
Olsen, Everett O.; LaCroix, James R.; and Bowditch, Hoel L., to Foxboro Co., The. Pressure measuring apparatus using vibratable wire. 4,329,775, Cl. 29-602.00A.
Olsen, Everett O.; Estes, Robert F.; Rezendes, Paul W.; and Williams, George F., to Foxboro Company, The. Transducer assembly providing position output proportional to electrical input signal. 4,329,910, Cl. 91-375.00R.
Olsson, Sven, to Societe d'Assistance Technique pour Produits Nestle S.A. Squids cleaning machine. 4,329,761, Cl. 17-71.000.
Olympia Werke AG: *See—*
Drescher, Wolfgang; and Rittberg, Eilt-Heyo, 4,330,010, Cl. 137-614.060.
Olympus Optical Co., Ltd.: *See—*
Hattori, Shinichiro, 4,330,186, Cl. 354-106.000.
Kato, Toshikazu; Saitou, Sinichi; Watanabe, Seizo; Nishiyama, Toyoo; Shimdda, Misao; Shibata, Tutomu; Kimura, Kenji; and Satoh, Ken, 4,330,802, Cl. 360-96.600.
Osanai, Akira, 4,330,805, Cl. 360-105.000.
Takayama, Syuichi, 4,330,189, Cl. 354-202.000.
Terada, Masaaki, 4,329,980, Cl. 128-4.000.
Omark Industries, Inc.: *See—*
Croydon, Frederic G., 4,330,229, Cl. 408-212.000.
Omori Machinery Co., Ltd.: *See—*
Omori, Shozo, 4,329,830, Cl. 53-453.000.
Omori, Shozo, to Omori Machinery Co., Ltd. Method and apparatus for packaging powdery or particle-size material. 4,329,830, Cl. 53-453.000.
Ondetti, Miguel A., to E. R. Squibb & Sons, Inc. Mercaptoacyl derivatives of keto substituted pipecolic acid. 4,330,548, Cl. 424-263.000.
Oppenheim, Gerd; and MacDonald, Angus. Optical lens layout and blocking device. 4,330,203, Cl. 356-127.000.
Optilon W. Erich Heilmann GmbH: *See—*
Heimberger, Helmut, 4,330,244, Cl. 425-115.000.
Optimetrix Corporation: *See—*
Rauskolb, Ruediger F., 4,330,752, Cl. 328-134.000.
Orban, Jean M., to Vivitar Corporation. Electronic flash system. 4,330,737, Cl. 315-241.00P.
O'Rell, Dennis D.; Hien, Nguyen V.; Lundquist, Joseph T., Jr.; and Lundsager, Christian B., to W. R. Grace & Co. Battery separator. 4,330,602, Cl. 429-206.000.
Orion Machinery and Engineering Corporation: *See—*
Griffiths, Evan, 4,329,861, Cl. 72-14.000.
Orova, Josef; and Podrapsky, Jiri, to Robert Bosch GmbH. Magneto ignition system with increased spark energy. 4,329,950, Cl. 123-149.00C.
ORR . . . Screw Machine Products, Inc.: *See—*
Orr, Thomas M.; and Baker, Paul V., 4,330,044, Cl. 175-410.000.
Orr, Thomas M.; and Baker, Paul V., to ORR . . . Screw Machine Products, Inc. Drill bit. 4,330,044, Cl. 175-410.000.
Orter, Ralph H. Rotatable cooker. 4,329,977, Cl. 126-369.000.
Osaki, Yasunori: *See—*
Ikeguchi, Nobuyuki; and Osaki, Yasunori, 4,330,669, Cl. 528-289.000.
Osanai, Akira, to Olympus Optical Co., Ltd. Tape recorder. 4,330,805, Cl. 360-105.000.
Oshima, Takao: *See—*
Hanyu, Susumu; and Oshima, Takao, 4,329,934, Cl. 112-226.000.
Oskar Frach Werkzeugbau GmbH & Co. KG: *See—*
Fink, Roland, 4,330,026, Cl. 164-457.000.
Ota, Akiho; and Hayashi, Yoshiaki, to Yoshino Kogyosho Co., Ltd. Parison for bottle product. 4,330,579, Cl. 428-35.000.
Otis Elevator Company: *See—*
Donofrio, Andrew J.; and Gaines, John E., 4,330,836, Cl. 364-567.000.
Otis Engineering Corporation: *See—*
Kohn, Gary A., 4,330,141, Cl. 285-93.000.
Otto, Franz: *See—*
Grabmaier, Christa; Otto, Franz; and Thomann, Helmut, 4,330,358, Cl. 156-603.000.
Ouchi, Hiromu: *See—*
Kawashima, Syunichiro; Nishida, Masamitsu; Ueda, Ichiro; and Ouchi, Hiromu, 4,330,631, Cl. 501-139.000.
Oudet, Claude. Electric step motor. 4,330,727, Cl. 310-268.000.
Outokumpu Oy: *See—*
Niitti, Timo U., 4,329,767, Cl. 29-402.080.
Owa, Kaoru: *See—*
Eto, Kunihiko; Seki, Shiro; and Owa, Kaoru, 4,329,771, Cl. 29-568.000.
Owens-Corning Fiberglas Corporation: *See—*
Hill, Robert L., 4,330,312, Cl. 65-1.000.
Hohman, Charles M.; Propster, Mark A.; and Seng, Stephen, 4,330,313, Cl. 65-2.000.
Hohman, Charles M.; Propster, Mark A.; and Seng, Stephen, 4,330,316, Cl. 65-27.000.
Propster, Mark A.; Seng, Stephen; and Hohman, Charles, 4,330,314, Cl. 65-27.000.
Varrasso, Eugene C., 4,330,246, Cl. 425-140.000.
Owens-Illinois, Inc.: *See—*
Go, Santos W., 4,330,661, Cl. 528-173.000.
Nelson, Frederick J.; Richards, Raymond S.; and Rough, Robert R., Sr., 4,330,315, Cl. 65-27.000.
Oxon Italia S.p.A.: *See—*
Motta, Raimondo, 4,330,477, Cl. 260-429.700.
Ozeki, Akichika: *See—*
Konishi, Jirou; Takasaki, Yasuto; Ohkoshi, Kenji; Ozeki, Akichika; Kajikawa, Shuji; and Itoh, Haruo, 4,330,264, Cl. 432-77.000.
Paddock, Paul F.: *See—*
Conway, Tim D.; and Paddock, Paul F., 4,330,062, Cl. 209-582.000.
Pai, Damodar M.: *See—*
Limburg, William W.; and Pai, Damodar M., 4,330,608, Cl. 430-59.000.
Paini, William R., to Fayette Tubular Products. Formed hose couplings. 4,330,142, Cl. 285-256.000.
Pak Pro International N.V.: *See—*
Torterotot, Roland, 4,329,829, Cl. 53-426.0(
Pako Corporation: *See—*
Rawlings, Robert M.; Heim, Derold D.; and Morain, Ronald E., 4,330,191, Cl. 354-345.000.
Paley, William S.: *See—*
Redmore, Derek; and Paley, William S., 4,330,487, Cl. 260-502.500.
Palfreyman, Jack; Angus, James P.; and Robertson, John M., to Rolls-Royce Limited. Dual-ring seal with temperature compensation. 4,330,133, Cl. 277-26.000.
Pallagi, Istvan: *See—*
Simonidesz, Vilmos; Papp nee Behr, Agnes; Kovacs, Gabor; Ivanics, Jozsef; Der nee Foldvary, Julia; Stadler, Istvan; and Pallagi, Istvan, 4,330,553, Cl. 424-285.000.
Palm, Lowell L.: *See—*
Davis, Kent L.; and Palm, Lowell L., 4,330,405, Cl. 210-331.000.
Pampalone, Thomas R., to RCA Corporation. Positive resist for electron beam and x-ray lithography and method of using same. 4,330,671, Cl. 528-382.000.
Panish, Morton B.: *See—*
Kubiak, Glenn D.; and Panish, Morton B., 4,330,360, Cl. 156-610.000.
Pantier, Earl A.: *See—*
Jackovitz, John F.; and Pantier, Earl A., 4,330,603, Cl. 429-206.000.
Papp nee Behr, Agnes: *See—*
Simonidesz, Vilmos; Papp nee Behr, Agnes; Kovacs, Gabor; Ivanics, Jozsef; Der nee Foldvary, Julia; Stadler, Istvan; and Pallagi, Istvan, 4,330,553, Cl. 424-285.000.
Paramythioti, Michel; and Degraeve, Francois, to Albaret S.A. Method and apparatus for controlling the frequency of vibration imparted to the ground by a compacting machine. 4,330,738, Cl. 318-128.000.
Pardue, William F., Jr.: *See—*
Allaire, Roger A.; Pardue, William F., Jr.; and VanDewoestine, Robert V., 4,330,503, Cl. 422-177.000.
Park, Won C.: *See—*
Di Giacomo, Peter M.; and Park, Won C., 4,330,153, Cl. 299-1.000.
Parker, Frederick D., to Bell Telephone Laboratories, Incorporated. Encapsulation for semiconductor device. 4,330,683, Cl. 174-52.0FP.
Parkinson, Ronald; and Howard, Robert W., to Falconbridge Nickel Mines Limited. Electrodeposition of sulfur-bearing nickel. 4,330,380, Cl. 204-123.000.
Parquet, Donald J.; and Pedersen, Carl O., to J. I. Case Company. Augmented charging system for a hydrostatic transmission. 4,329,845, Cl. 60-422.000.
Parsons, John R.: *See—*
Alexander, Harold; Parsons, John R.; Strauchler, Irving D.; and Weiss, Andrew B., 4,329,743, Cl. 3-1.000.
Passarelli, Jamie R.: *See—*
Reichenbach, Jerry D.; and Passarelli, Jamie R., 4,330,256, Cl. 425-537.000.

Patel, Natu R.; and Rutter, Jerry L., to Gulf Oil Corporation. N-(Arylthiocarbamoyl)-2-amino-1H-isoindole-1,3,-(2H) dione plant growth regulators. 4,330,322, Cl. 71-96.000.

Patton, Tad L., to Exxon Research & Engineering Co. Polymers characterized by 1,3-imidazolidine-1,3-diyl rings plasticized with esters of aromatic carboxylic acids. 4,330,453, Cl. 524-294.000.

Patukonis, Robert J., to Weinschel Engineering Co., Inc. Switchable microwave step attenuator with compensation for linear operation over wide frequency range. 4,330,765, Cl. 333-81.00A.

Pawelko, Karl-Heinz; and Deutsch, Reinhard, to Hauni-Werke Korber & Co. KG. Apparatus for subdividing a web of wrapping material into sections of predetermined length. 4,329,898, Cl. 83-251.000.

Payne, Trevor G., to Sandoz Ltd. Indanyloxamic derivatives, their preparation and pharmaceutical compositions containing them. 4,330,555, Cl. 424-309.000.

Payrhammer, Bernd: *See*—
Bartel, Siegfried; Payrhammer, Bernd; and Nagel, Erich, 4,330,096, Cl. 242-74.100.

PCUK Produits Chimiques Ugine Kuhlmann: *See*—
Gorny, Bernard S. J. M.; Brun, Jean-Paul; Boutemy, Gerard E. M.; and Devif, Michel L., 4,330,323, Cl. 71-100.000.
Schirmann, Jean-Pierre, 4,330,485, Cl. 260-502.00R.

Pedersen, Carl O.: *See*—
Parquet, Donald J.; and Pedersen, Carl O., 4,329,845, Cl. 60-422.000.

Peiler, Rolf W., to Deere & Company. Grate adjusting arrangement for an axial flow rotary thresher. 4,330,000, Cl. 130-27.00L.

Pennwalt Corporation: *See*—
Warkentin, Aaron J.; and Hiebert, Jacob, 4,329,831, Cl. 53-537.000.

Pentlicki, Chester J., to Communications Satellite Corporation. Electromechanical switch. 4,330,766, Cl. 333-105.000.

Perez, Arthur: *See*—
Abraham, Fayez F.; and Perez, Arthur, 4,329,852, Cl. 62-256.000.

Perini, Guglielmo. Machine for cutting simultaneously one or more rolls or sticks of paper to obtain a plurality of small rolls. 4,329,895, Cl. 83-174.000.

Perkin-Elmer Corporation, The: *See*—
Roman, Walter A., 4,330,092, Cl. 241-232.000.

Perper, Lloyd J., to Iota Engineering, Inc. Compensated current feedback oscillator ballast for fluorescent lamps and the like. 4,330,736, Cl. 315-209.00R.

Perry, Robert H., to Westinghouse Electric Corp. Transit vehicle control apparatus and method. 4,330,830, Cl. 364-436.000.

Peschel, Stanley G. Variable voltage direct current power supply and motor speed control. 4,330,818, Cl. 363-126.000.

Peter F. Loftus Corporation (Illinois): *See*—
Nelson, Theodore W., Jr.; Corkle, David B.; Wolfe, Joel Z.; and Ganzel, Larry A., 4,330,511, Cl. 423-210.000.

Peters Machinery Company, Subsidiary of Katy Industries, Inc.: *See*—
Rose, Edward; and Weber, David E., 4,329,920, Cl. 99-450.400.

Petersen, John H.: *See*—
Jorgensen, Lars L. S.; Jorgensen, Ernst V.; and Petersen, John H., 4,330,260, Cl. 431-12.000.

Peterson, Anders A., to Hardinge Brothers, Inc. Presetter gauge. 4,329,785, Cl. 33-185.00R.

Peterson, Michael: *See*—
Ferdinand, Irwin J.; Sylvan, Richard; and Peterson, Michael, 4,330,113, Cl. 269-88.000.

Peterson, Phillip R.; Gavrielides, Athanasios; and Erkkila, John H., to United States of America, Air Force. Method and apparatus for detecting small angular beam deviations. 4,330,211, Cl. 356-354.000.

Peterson, Raymond A., to United Geophysical Corporation. Aplanatic geophysical exploration system. 4,330,873, Cl. 367-60.000.

Petersson, Stefan; and Alstad, Sven O., to Kockums Industri AB. Continuously operating press. 4,330,249, Cl. 425-329.000.

Petit, Pierre: *See*—
Grenier, Maurice; and Petit, Pierre, 4,330,308, Cl. 62-40.000.

Petrolite Corporation: *See*—
Redmore, Derek; and Paley, William S., 4,330,487, Cl. 260-502.500.

Petzoldt, Karl: *See*—
Annen, Klaus; Laurent, Henry; Hofmeister, Helmut; Petzoldt, Karl; and Wiechert, Rudolf, 4,330,541, Cl. 424-243.000.

Philip Morris, Incorporated: *See*—
Grollimund, Everett C.; and Spiers, Steven F., 4,330,356, Cl. 156-446.000.

Phillips, Michael. Patient attached patch and method of making. 4,329,999, Cl. 128-760.000.

Phillips Petroleum Company: *See*—
Glinsmann, Gibert R.; and Hedges, James H., 4,330,418, Cl. 252-8.55D.
Welch, M. Bruce, 4,330,648, Cl. 526-125.000.

Phillips, Robert R.: *See*—
Lundberg, Robert D.; Phillips, Robert R.; and Duvdevani, Ilan, 4,330,447, Cl. 524-269.000.

Photo-tronics, Inc.: *See*—
Fattore, James T., Jr.; Fattore, Robert L.; Angevine, William R.; and Spence, John R., 4,330,184, Cl. 354-81.000.

Phung, Trung Kiet: *See*—
Maldonado, Paul; Eber, Daniele; and Phung, Trung Kiet, 4,330,449, Cl. 524-68.000.

Pierrel, Michel: *See*—
Fuminier, Claude; and Pierrel, Michel, 4,330,015, Cl. 138-109.000.

Pierson, Marvin B.; and Flinchum, Charles, to Armco Inc. Finishing method for conventional hot dip coating of a ferrous base metal strip with a molten coating metal. 4,330,574, Cl. 427-319.000.

Pietschmann, Frank; John, Gunter; Eistert, Theddor; Noack, Christian; Oliva, Klaus; Zumpe, Bernd; Spaida, Hans P.; Boltizar, Pal; Fabry, Istvan; Vida, Csongor; Lakos, Lajos; and Klement, Matjas, to VEB Kombinat Fortschritt Landmaschinen Neustadt in Sachsen. Pickup head for long-stalk agricultural crops grown in row culture. 4,329,832, Cl. 56-98.000.

Pilkington Brothers Limited: *See*—
Cockram, David R.; and Fyles, Kenneth M., 4,330,628, Cl. 501-38.000.

Pinkas, Peter, to Dorst-Keramikmaschinen-Bau. Press diaphragm. 4,330,250, Cl. 425-389.000.

Pinsler, Heinz W.: *See*—
Neyhart, James H.; Brown, George A.; Relyea, Lloyd A.; Scharfe, Merlin E.; and Pinsler, Heinz W., 4,330,609, Cl. 430-126.000.

Pissiotas, Georg; and Beriger, Ernst, to Ciba-Geigy Corporation. Oxime phosphates and their use for combating pests. 4,330,536, Cl. 424-200.000.

Pittman, Robert B.; Wescott, Ronald O.; and Offerman, Michael, to Industrial Electronic Hardware Corp. Hermaphrodite electrical connector. 4,330,164, Cl. 339-49.00R.

Pittsburg & Midway Coal Mining Co., The: *See*—
Anderson, Raymond P.; Schmalzer, David K.; and Wright, Charles H., 4,330,388, Cl. 208-8.0LE.

Plaisance, Thomas H.: *See*—
Killeen, James J.; Plaisance, Thomas H.; and Sekmakas, Kazys, 4,330,445, Cl. 525-501.500.

Planter Technology Investments Limited: *See*—
Secrest, Allen D., 4,329,815, Cl. 47-80.000.

Plasma Physics Corporation: *See*—
Coleman, John H., 4,330,182, Cl. 352-2.000.

Plastics, Inc.: *See*—
Danley, Allen M.; and Colato, Albert E., 4,330,697, Cl. 219-10.55F.
Pomeroy, James F.; Colato, Albert E.; Danley, Allen M.; and Gerling, John E., 4,330,696, Cl. 219-10.55F.

Platte, Richard L. Mold with adjustable inserts. 4,330,248, Cl. 425-183.000.

Playdon, Gary W.: *See*—
Coombs, Peter M.; Playdon, Gary W.; and Koczela, Jeffrey J., 4,330,114, Cl. 271-22.000.

Plessey Overseas Limited: *See*—
Johnson, Phillip L. M., 4,330,876, Cl. 367-105.000.
Spurry, Roderick H., 4,330,241, Cl. 418-132.000.

Pochert, Rudolf: *See*—
Jagieniak, Peter; Koerdt, Hans; Bohme, Jochen; Odrich, Dieter; Pochert, Rudolf; and Wiese, Peter, 4,330,700, Cl. 219-121.0PP.

Podrapsky, Jiri: *See*—
Orova, Josef; and Podrapsky, Jiri, 4,329,950, Cl. 123-149.00C.

Pohl, Hans: *See*—
von und zu Aufsess, Friedrich F.; Huxhorn, Gunter; Pohl, Hans; and Sasse, Wolfgang, 4,330,499, Cl. 264-289.600.

Pohl, Ludwig: *See*—
Eidenschink, Rudolf; Erdmann, Dietrich; Krause, Joachim; and Pohl, Ludwig, 4,330,426, Cl. 252-299.630.

Poirier, Norbert: *See*—
Minkiewicz, Andre E.; and Poirier, Norbert, 4,330,074, Cl. 228-29.000.

Polaroid Corporation: *See*—
Andrews, Paul A., 4,330,350, Cl. 156-152.000.

Poling, Ronald W., to General Electric Company. Control device. 4,330,695, Cl. 200-83.00P.

Poliniak, Eugene S.: *See*—
Datta, Pabitra; and Poliniak, Eugene S., 4,330,583, Cl. 428-65.000.

Pollman, Gary A., to PPG Industries, Inc. Sizing composition and sized fibers with increased hardness. 4,330,444, Cl. 523-404.000.

Polymer Technology Corporation: *See*—
Ellis, Edward J.; and Mager, Louis, 4,330,383, Cl. 204-159.130.

Pomeroy, James F.; Colato, Albert E.; Danley, Allen M.; and Gerling, John E., to Plastics, Inc. Portable turntable for ovens. 4,330,696, Cl. 219-10.55F.

Pommer, Ernst-Heinrich: *See*—
Acker, Rolf-Dieter; Buschmann, Ernst; Thym, Sabine; Zeeh, Bernd; and Pommer, Ernst-Heinrich, 4,330,535, Cl. 424-184.000.

Pompon, Jean-Bernard: *See*—
Bonnaud, Bernard; and Pompon, Jean-Bernard, 4,330,456, Cl. 524-46.000.

Pont-A-Mousson S.A.: *See*—
Fuminier, Claude; and Pierrel, Michel, 4,330,015, Cl. 138-109.000.

Poquet, Jean-Paul: *See*—
Eyrard, Pierre; and Poquet, Jean-Paul, 4,330,585, Cl. 428-131.000.

Porcelli, Richard V.: *See*—
Lal, Sudarshan; and Porcelli, Richard V., 4,330,376, Cl. 204-47.000.

Portolese, Larry A.: *See*—
Cybulski, Mark J.; Gumkowski, Bert A.; and Portolese, Larry A., 4,330,049, Cl. 188-73.360.

Possati, Mario; Golinelli, Guido; and Selleri, Narciso, to Finike Italiana Marposs, S.p.A. Gauge for checking sizes of mechanical parts. 4,329,782, Cl. 33-147.00K.

Pott, Gerard T.; and Stuiver, Johannes C. M., to Shell Oil Company. Process for the conversion of hydrocarbons employing a sulphided fluorine-containing nickel-tungsten catalyst. 4,330,395, Cl. 208-115.000.

Powell, Justin C.: *See*—
Cummings, William M.; and Powell, Justin C., 4,330,303, Cl. 44-63.000.

PPG Industries, Inc.: *See*—
Buchwalter, Stephen L., 4,330,640, Cl. 524-555.000.
Graham, Roy R., 4,330,337, Cl. 106-135.000.
Jensen, Thomas H., 4,330,311, Cl. 65-1.000.

Pollman, Gary A., 4,330,444, Cl. 523-404.000.

Pratt, William K.; Abramatic, Jean-Francois; and Faugeras, Olivier, to Vicom Systems, Inc. Method and apparatus for improved digital image processing. 4,330,833, Cl. 364-515.000.

Premier Forging Press Automation, Inc.: *See*—
Babbitt, Albert B., 4,329,866, Cl. 72-405.000.

Price, James L.: *See*—
Kittle, Carl E.; and Price, James L., 4,329,857, Cl. 220-229.000.

Price, Robert, to Sperry Corporation. Interleaved dipulse sequence generating apparatus for data transmission or recording channels. 4,330,799, Cl. 360-40.000.

Probst, Heinz: *See*—
Martini, Thomas; Erckel, Rudiger; Fruhbeis, Horst; Rosch, Gunter; and Probst, Heinz, 4,330,427, Cl. 252-301.240.

Process Development Company: *See*—
Boze, Ronald A.; and Canzoneri, Anthony S., 4,330,401, Cl. 210-106.000.

Procter & Gamble Company, The: *See*—
Baker, Bennie L., 4,330,530, Cl. 424-131.000.
Francis, Marion D., 4,330,537, Cl. 424-204.000.

Propster, Mark A.; Seng, Stephen; and Hohman, Charles, to Owens-Corning Fiberglas Corporation. Apparatus and process for predrying and preheating glass batch agglomerates before melting. 4,330,314, Cl. 65-27.000.

Propster, Mark A.: *See*—
Hohman, Charles M.; Propster, Mark A.; and Seng, Stephen, 4,330,313, Cl. 65-2.000.
Hohman, Charles M.; Propster, Mark A.; and Seng, Stephen, 4,330,316, Cl. 65-27.000.

Proudlove, Michael J.: *See*—
Hyde, Eric A.; Goldsmith, Hugh A.; and Proudlove, Michael J., 4,330,865, Cl. 376-249.000.

Pryor, Michael J.; and Winter, Joseph, to Olin Corporation. Cooperative rolling process and apparatus. 4,329,863, Cl. 72-205.000.

Pryor, Michael J., to Olin Corporation. Disposable bed filter process and apparatus. 4,330,327, Cl. 75-76.000.

Pryor, Michael J.: *See*—
Tyler, Derek E.; Cheskis, Harvey P.; Stone, Louis P.; and Pryor, Michael J., 4,330,328, Cl. 75-76.000.

Pucher, Richard A., to Sperry Corporation. Latch for corn harvesting header. 4,329,835, Cl. 56-320.100.

Pujari, Vimal K.; and Trentelman, Jackson P., to Corning Glass Works. Seal column apparatus and method. 4,330,028, Cl. 165-1.000.

Purdue Research Foundation: *See*—
Banker, Gilbert S., 4,330,338, Cl. 106-197.00C.

Purification Sciences Inc.: *See*—
Lowther, Frank E., 4,330,732, Cl. 313-130.000.

Putti, George. Machine for extruding hollow cored concrete sections. 4,330,242, Cl. 425-64.000.

Quinn, Edward J.: *See*—
Campbell, Donald H.; and Quinn, Edward J., 4,330,515, Cl. 423-316.000.

Race, Donald P. Jump rope. 4,330,118, Cl. 272-75.000.

Rail, Robert D.: *See*—
Haynes, Harvey H.; and Rail, Robert D., 4,330,632, Cl. 501-140.000.

Rain Bird Sprinkler Manufacturing Corporation: *See*—
Wood, William A.; and D'Amore, Frank J., 4,330,087, Cl. 239-233.000.

Ramsley, Dean E. Controlled pollution control valve by-pass device for carbureted internal combustion engine. 4,329,966, Cl. 123-572.000.

Ramstrom, Lee W.; and Strnad, Raymond, to Scott & Fetzer Company, The. Headlight cap wiring harness and switch. 4,329,757, Cl. 15-324.000.

Rankin, John C., to United States of America, Agriculture. Dry chemical process for grafting acrylic and methyl acrylic ester and amide monomers onto starch-containing materials. 4,330,443, Cl. 527-312.000.

Rao, G. R. Mohan: *See*—
Redwine, Donald J.; White, Lionel S., Jr.; and Rao, G. R. Mohan, 4,330,852, Cl. 365-221.000.

Rapoport, Morris, to Du Pont de Nemours, E. I., and Company. Hydrocyanation of olefins. 4,330,483, Cl. 260-465.80R.

Rastrom, Arne, to Stal-Laval Turbin AB. Back pressure turbine for a district heating plant having a cut-off valve between the turbine and the condenser. 4,329,847, Cl. 60-648.000.

Rat, Pierre: *See*—
Lebas, Jean-Marie; Rat, Pierre; Dupont, Jean-Marcel; and Vinuesa, Germain, 4,330,251, Cl. 425-405.00H.

Rauskolb, Ruediger F., to Optimetrix Corporation. Position control circuit. 4,330,752, Cl. 328-134.000.

Rawlings, Robert M.; Heim, Derold D.; and Morain, Ronald E., to Pako Corporation. Connector device for attaching photographic web material to a leader belt. 4,330,191, Cl. 354-345.000.

Ray, C. Michael: *See*—
Swift, Joseph A.; Ray, C. Michael; and Ewing, Joan R., 4,330,349, Cl. 156-72.000.

Raychem Corporation: *See*—
Horsma, David A.; Lyons, Bernard J.; and Smith-Johannsen, Robert, 4,330,703, Cl. 219-553.000.
Jensen, Michael L., 4,330,704, Cl. 219-553.000.

Raye, Pierre; Jaquiery, Henri; and Gehri, Hermann, to Stellram S.A. Cutting tool with interchangeable insert-holding cartridges. 4,330,227, Cl. 407-36.000.

Raymond International Builders, Inc.: *See*—
Holland, Henry A. N., 4,329,937, Cl. 118-105.000.

Raymond, Robert F.; and Dupen, Clive F. G., to Electric Power Research Institute, Inc. Support structure core assembly in a nuclear reactor. 4,330,371, Cl. 376-258.000.

RCA Corporation: *See*—
Datta, Pabitra; and Poliniak, Eugene S., 4,330,583, Cl. 428-65.000.
Kleinknecht, Hans P.; and Meier, Heinrich, 4,330,213, Cl. 356-355.000.
Leedom, Marvin A., 4,330,735, Cl. 313-422.000.
Malchow, Max E., 4,330,866, Cl. 455-161.000.
Naimpally, Saiprasad V., 4,330,792, Cl. 358-33.000.
Nosker, Richard W., 4,330,881, Cl. 369-50.000.
Pampalone, Thomas R., 4,330,671, Cl. 528-382.000.
Stewart, Wilber C.; and Alphonse, Gerard A., 4,330,882, Cl. 369-55.000.
Wine, Charles M., 4,330,879, Cl. 369-32.000.

Reale, John, Jr.: *See*—
White, William R.; and Reale, John, Jr., 4,330,420, Cl. 252-32.70E.

Redfern, John T.; and Dressel, Gary A., to United States of America, Navy. Apparatus for multiplexing digital signals. 4,330,855, Cl. 370-100.000.

Redmore, Derek; and Paley, William S., to Petrolite Corporation. N,N-Dimethylene phosponic acids of alkylene diamines. 4,330,487, Cl. 260-502.500.

Redwine, Donald J.; White, Lionel S., Jr.; and Rao, G. R. Mohan, to Texas Instruments Incorporated. Semiconductor read/write memory array having serial access. 4,330,852, Cl. 365-221.000.

Reece, Alan R., to British Petroleum Company Limited, The. Soil moving device. 4,329,793, Cl. 37-98.000.

Reece, Vernon N. Bucking amusement apparatus. 4,329,809, Cl. 46-101.000.

Rees, Herbert; Brown, Paul; and Grund, Miroslaw, to Husky Injection Molding Systems, Inc. Turret-type injection-molding machine. 4,330,257, Cl. 425-556.000.

Reichenbach, Jerry D.; and Passarelli, Jamie R., to CR Industries. Molded article knock-out apparatus. 4,330,256, Cl. 425-537.000.

Reichert, Robert B. Fireplace grate lift and lock attachment. 4,329,974, Cl. 126-164.000.

Reim, Robert E.: *See*—
Hawn, David D.; and Reim, Robert E., 4,330,298, Cl. 23-230.0PC.

Reimers, Eberhart. Circuitry for recovering electrical energy with an electric vehicle DC propulsion motor when braking. 4,330,742, Cl. 320-14.000.

Reitz, Gunther: *See*—
Schaupp, Kurt; Reitz, Gunther; and Boehmke, Gunther, 4,330,334, Cl. 106-90.000.

Reliance Electric Company: *See*—
Myers, Walter I., 4,330,045, Cl. 180-65.00F.

Reliance Truck Company: *See*—
Gallagher, Roger W., 4,330,105, Cl. 254-89.00R.

Relyea, Lloyd A.: *See*—
Neyhart, James H.; Brown, George A.; Relyea, Lloyd A.; Scharfe, Merlin E.; and Pinsler, Heinz W., 4,330,609, Cl. 430-126.000.

Remington Arms Company, Inc.: *See*—
Rowlands, Kenneth C., 4,329,908, Cl. 89-24.000.

Reneau, Bobby J. Apparatus for connecting together flowline end portions. 4,330,143, Cl. 285-322.000.

Renk, Ehrengard B.: *See*—
Adcock, James L.; and Renk, Ehrengard B., 4,330,475, Cl. 549-380.000.

Renteria, Sergio: *See*—
de Yampert, H. Donn; and Renteria, Sergio, 4,329,997, Cl. 128-402.000.

Repa Feinstanzwerk GmbH: *See*—
Fohl, Artur, 4,329,758, Cl. 16-273.000.

Resonant Technology Co.: *See*—
Gurries, Raymond A., 4,330,156, Cl. 299-37.000.

Retter, Charles T., to Data General Corporation. High speed compact digital computer system with segmentally stored microinstructions. 4,330,823, Cl. 364-200.000.

Reynolds, Jack B.; and Amos, Charles R., to Dow Chemical Co., The. Process for the production of dead burned refractory magnesia. 4,330,525, Cl. 423-636.000.

Rezendes, Paul W.: *See*—
Olsen, Everett O.; Estes, Robert F.; Rezendes, Paul W.; and Williams, George F., 4,329,910, Cl. 91-375.00R.

Rhone-Poulenc Industries: *See*—
Winand, Louis, 4,330,516, Cl. 423-321.00S.

Ribble, George W.: *See*—
Vann, Roy R.; Ribble, George W.; and George, Flint R., 4,330,039, Cl. 166-297.000.

Rich, Hubert A.; Saffer, Gary M.; and Woolington, John C., to Mattel, Inc. Paper-airplane-making and launching device. 4,329,808, Cl. 46-81.000.

Richard, Francoise: *See*—
Bouillon, Claude; Vayssie, Charles; and Richard, Francoise, 4,330,488, Cl. 260-511.000.

Richards, Raymond S.: *See*—
Nelson, Frederick J.; Richards, Raymond S.; and Rough, Robert R., Sr., 4,330,315, Cl. 65-27.000.

Richardson, Edwin A.; and Fair, Walter B., Jr., to Shell Oil Company. Well treating process for chemically heating and modifying a subterranean reservoir. 4,330,037, Cl. 166-250.000.

Richardson Graphics Company: *See*—
Thomas, Daniel C.; and Sorkin, Jack L., 4,330,611, Cl. 430-156.000.

Richardson, Paul; and Whitley, David A., to Santa Fe International Corporation. Bore hole mining. 4,330,155, Cl. 299-11.000.

Richter Gedeon Vegyeszeti Gyar Rt.: *See*—
Nyeki, Olga; Kisfaludy, Lajos; Karpati, Egon; and Szporny, Laszlo, 4,330,532, Cl. 424-177.000.

Ricoh Company, Ltd.: *See*—
Eda, Tadahiro; Tatsumi, Susumu; and Imai, Chikara, 4,330,749, Cl. 324-457.000.
Kikuchi, Hideo; Kaneko, Tamaki; Ikeda, Sunao; Okuzawa, Tugio; Kakitani, Yohtaro; and Hibi, Kunio, 4,330,200, Cl. 355-24.000.
Murakami, Kakuji, 4,330,194, Cl. 355-3.00R.

Ridenour, Ralph G. Tube fitting assembly with deformable seal. 4,330,144, Cl. 285-382.500.

Ridyard, Denis R. A.: *See*—
Brierley, David; Ridyard, Denis R. A.; and Yelland, Michael, 4,330,468, Cl. 260-198.000.

Riley, James E., to Alpine Manufacturing Company, Inc. Draft air deflecting device. 4,329,930, Cl. 110-175.00R.

Rittberg, Eilt-Heyo: *See*—
Drescher, Wolfgang; and Rittberg, Eilt-Heyo, 4,330,010, Cl. 137-614.060.

Ritz, William C.: *See*—
Kazan, Joseph M.; Sharbaugh, John E.; and Ritz, William C., 4,330,370, Cl. 376-200.000.

Rivoir, Karl H. Measuring mechanism for wide-angle moving coil systems and method for its assembly. 4,330,747, Cl. 324-150.000.

Robert Bosch GmbH: *See*—
Foerster, Hubert; and Sochor, Josef, 4,330,795, Cl. 358-127.000.
Orova, Josef; and Podrapsky, Jiri, 4,329,950, Cl. 123-149.00C.
Schwerin, Gunter, 4,329,911, Cl. 91-387.000.

Roberts, Gerald L., to General Electric Company. Basket mounting arrangement for a washing machine. 4,329,859, Cl. 68-23.00R.

Robertson, John M.: *See*—
Palfreyman, Jack; Angus, James P.; and Robertson, John M., 4,330,133, Cl. 277-26.000.

Robieux, Jean, to Societe Anonyme dite: Compagnie Generale d'Electricite. System of optical telephony. 4,330,869, Cl. 455-607.000.

Robinson, Glen P., Jr. Heat pump water heater. 4,330,309, Cl. 62-181.000.

Roblin, Bernard: *See*—
Guery, Jean-Pierre; and Roblin, Bernard, 4,330,693, Cl. 200-1.00R.

Rockwell International Corporation: *See*—
Abbott, Ned E.; Keshavan, Hampapur R.; and McGuire, Robert J., 4,330,885, Cl. 370-17.000.
Hallford, Ben R., 4,330,868, Cl. 455-327.000.
Hauck, James P.; Hayes, Cecil L.; and McMullen, James D., 4,330,721, Cl. 307-425.000.

Rodaway, Bruce K., to Dunlop Limited. Foam composites. 4,330,634, Cl. 521-65.000.

Roe, Stephen. Loudspeaker systems. 4,330,686, Cl. 179-1.00A.

Roeder, George K. Packer nose assembly. 4,329,916, Cl. 92-240.000.

Roesch, Androniki: *See*—
Friebe, Walter-Gunar; Winter, Werner; Thiel, Max; Roesch, Androniki; and Wilhelms, Otto-Henning, 4,330,549, Cl. 424-267.000.

Rogers, James B., to Dresser Industries, Inc. Ripping attachment for dragline. 4,329,794, Cl. 37-115.000.

Rogers, Thomas D.; Edmons, Rhonda J.; and McBryar, Gordon D., to Rogers, Thomas Derrill; and Edmons, Rhonda Joy. Subclavian intravenous clamp. 4,329,987, Cl. 128-214.00R.

Rogers, Thomas Derrill: *See*—
Rogers, Thomas D.; Edmons, Rhonda J.; and McBryar, Gordon D., 4,329,987, Cl. 128-214.00R.

Rohm and Haas Company: *See*—
Bayer, Horst O.; Swithenbank, Colin; and Yih, Roy Y., 4,330,324, Cl. 71-105.000.

Roller, Gunter, to Davy McKee Aktiengesellschaft. Process and apparatus for preventing NO_x emissions after emergency shutdowns of plants for the manufacture of nitric acid. 4,330,520, Cl. 423-392.000.

Rolls-Royce Limited: *See*—
Colley, Rowan H., 4,330,234, Cl. 415-171.000.
Litchfield, William B.; Gent, John T.; and Graham, James A. S., 4,330,575, Cl. 427-376.300.
Palfreyman, Jack; Angus, James P.; and Robertson, John M., 4,330,133, Cl. 277-26.000.

Roman, Walter A., to Perkin-Elmer Corporation, The. In-line shredder apparatus. 4,330,092, Cl. 241-232.000.

Romanenko, Alexandra. Blue background slides from a black and white film process. 4,330,615, Cl. 430-370.000.

Romanova, Valentina P.: *See*—
Kuznetsov, Lev B.; Strelkov, Valentin V.; Zaitsev, Anatoly V.; Lvov, Igor A.; and Romanova, Valentina P., 4,329,868, Cl. 73-19.000.

Romero, Romer A.: *See*—
Taylor, James W.; and Romero, Romer A., 4,330,295, Cl. 23-230.00M.

Roobeek, Cornelis F.: *See*—
Van Leeuwen, Petrus W. N. M.; and Roobeek, Cornelis F., 4,330,678, Cl. 568-454.000.

Rosan, Alan M.: *See*—
Yardley, James T.; Rosan, Alan M.; and Menger-Hammond, Eva L., 4,330,382, Cl. 204-157.10R.

Rosch, Gunter: *See*—
Martini, Thomas; Erckel, Rudiger; Fruhbeis, Horst; Rosch, Gunter; and Probst, Heinz, 4,330,427, Cl. 252-301.240.

Rose, Edward; and Weber, David E., to Peters Machinery Company, Subsidiary of Katy Industries, Inc. Sandwiching machine and turnover mechanism therefor. 4,329,920, Cl. 99-450.400.

Rosen, Kurt J. Soldering tool with feeder mechanism. 4,330,075, Cl. 228-53.000.

Rosenbrook, William, Jr., to Abbott Laboratories. Process for producing 3-O-demethylaminoglycoside and novel 3-O-demethylfortimicin derivatives. 4,330,673, Cl. 536-16.100.

Rosenquist, Niles R., to General Electric Company. Benzoate ester terminated polyester-carbonate. 4,330,663, Cl. 528-176.000.

Rosenthal, Joel W.; and Dahlberg, Arthur J., to Chevron Research Company. Coal liquefaction process. 4,330,389, Cl. 208-10.000.

Rosenthal, Joel W.; and Dahlberg, Arthur J., to Chevron Research Company. Two-stage coal liquefaction process with petroleum-derived coal solvents. 4,330,390, Cl. 208-10.000.

Rosenthal, Joel W.; and Dahlberg, Arthur J., to Chevron Research Company. Coal liquefaction process. 4,330,391, Cl. 208-10.000.

Rosenthal, Joel W.; and Dahlberg, Arthur J., to Chevron Research Company. Two-stage coal liquefaction process with petroleum-derived coal solvents. 4,330,393, Cl. 208-10.000.

Ross Operating Valve Company: *See*—
Cameron, Russell J., 4,330,013, Cl. 137-637.100.

Rossi, Antonio: *See*—
Busacca, Guido; Meli, Vincenzo; and Rossi, Antonio, 4,330,760, Cl. 331-55.000.

Rothgordt, Ulf: *See*—
Hinz, Hans D.; Rothgordt, Ulf; and Lobl, Herbert, 4,330,788, Cl. 346-157.000.

Roto-Finish Company, Inc.: *See*—
Balz, Gunther W., 4,329,817, Cl. 51-163.200.

Rouger, Michel: *See*—
Garin, Arlette; Rouger, Michel; and Saudinos, Jean, 4,330,731, Cl. 313-104.000.

Rough, Robert R., Sr.: *See*—
Nelson, Frederick J.; Richards, Raymond S.; and Rough, Robert R., Sr., 4,330,315, Cl. 65-27.000.

Roux, Jacques: *See*—
Foch, Henri; and Roux, Jacques, 4,330,819, Cl. 363-132.000.

Row, Jon D., to American Honda Motor Co., Inc. Motorcycle antitheft system. 4,329,953, Cl. 123-198.00B.

Rowlands, Kenneth C., to Remington Arms Company, Inc. Recoil-operated firing pin retractor for electrically-fired guns. 4,329,908, Cl. 89-24.000.

Rozeboom, Antonie G.; and Van Beek, John H. Self-loading feed mixer and transport apparatus. 4,330,091, Cl. 241-73.000.

Rubber & Plastics Research Assoc of GB: *See*—
Gale, George M., 4,330,215, Cl. 366-99.000.

Rudolph, Hans: *See*—
Krimm, Heinrich; Buysch, Hans-Josef; and Rudolph, Hans, 4,330,665, Cl. 528-200.000.
Wolfers, Heinrich; Mayer, Wolfram; Rudolph, Hans; and Mietzsch, Fritz, 4,330,638, Cl. 525-12.000.

Rudszinat, Willy; and Abrahams, Siegfried, to Hauni-Werke Korber & Co. KG. Method and apparatus for detecting and segregating defective commodities from a series of discrete commodities. 4,330,061, Cl. 209-3.100.

Ruf, Wolfgang: *See*—
Stemme, Otto; Wagensonner, Eduard; and Ruf, Wolfgang, 4,330,793, Cl. 358-56.000.

Ruhenstroth-Bauer, Gerhard; and Goldberg, Michel, to Max-Planck-Gesellschaft zur Foerderung der Wissenschaften E.V. Drug for stimulating the rate of proliferation of liver cells and method for producing same. 4,330,528, Cl. 424-101.000.

Rumble, Joseph W., to Brunswick Corporation. High flex golf shaft having reverse tapered butt section. 4,330,126, Cl. 273-80.00R.

Ruspa, Giacomo; and Franco, Luigi, to Centro Ricerche Fiat S.p.A. Sound-attenuating ventilation. 4,330,047, Cl. 181-224.000.

Russell, Alexander H., to Burns and Russell Company, The. Filled polymeric wall facing units and systems. 4,329,822, Cl. 52-309.160.

Russell, Chesley G. Support pad. 4,329,747, Cl. 5-420.000.

Russell, Robert C.; Burton, Charles A.; Coleman, Ronald K.; and Schroeder, Dwain R. Packaging machine with pouch transfer and opening mechanism. 4,330,288, Cl. 493-197.000.

Rust, Bob. Automatic vehicle headlight control system. 4,330,716, Cl. 307-10.0LS.

Rutkowski, Edward V., Jr.: *See*—
Churgovich, Dennis M.; Joest, William F., III; McCray, William R.; and Rutkowski, Edward V., Jr., 4,330,217, Cl. 400-64.000.

Rutter, Jerry L.: *See*—
Patel, Natu R.; and Rutter, Jerry L., 4,330,322, Cl. 71-96.000.

Rybak, Karel: *See*—
Boehm, Valter; Marosczyk, Veslav; Cieslar, Antonin; Bartuska, Miloslav; Rybak, Karel; Zverina, Karel; and Zelezny, Eduard, 4,330,568, Cl. 427-34.000.

Ryder, Francis E.: *See*—
Thomas, Michael D.; and Ryder, Francis E., 4,330,627, Cl. 435-301.000.

Ryder International Corporation: *See*—
Thomas, Michael D.; and Ryder, Francis E., 4,330,627, Cl. 435-301.000.

Ryno, Gaylon E.; and Hoffman, John G., to United States of America, Navy. Variable waveguide continuous slot antenna. 4,330,784, Cl. 343-771.000.

Sado, Ryoichi, to Shin-Etsu Polymer Co., Ltd. Press-contact type interconnectors. 4,330,165, Cl. 339-59.00M.

Sadoulet, Jean-Paul: *See*—
Thuries, Edmond; Sadoulet, Jean-Paul; and Dufournet, Denis, 4,330,103, Cl. 248-548.000.

Saffer, Gary M.: *See*—
Rich, Hubert A.; Saffer, Gary M.; and Woolington, John C., 4,329,808, Cl. 46-81.000.
Sage, Henry F.: *See*—
Albright, Donald R.; Sage, Henry F.; and Archibald, James B., 4,330,726, Cl. 310-254.000.
Saito, Kenji: *See*—
Nakanishi, Kyoji; Saito, Kenji; Kato, Yoshiei; Nozaki, Tsutomu; and Emi, Toshihiko, 4,330,108, Cl. 266-47.000.
Saito, Masumi; Hirai, Eiichi; Endo, Masao; and Nishino, Toru, to Kurashiki Boseki Kabushiki Kaisha. Foamed gypsum moulded articles and production thereof. 4,330,589, Cl. 428-312.400.
Saitou, Sinichi: *See*—
Kato, Toshikazu; Saitou, Sinichi; Watanabe, Seizo; Nishiyama, Toyoo; Shimdda, Misao; Shibata, Tutomu; Kimura, Kenji; and Satoh, Ken, 4,330,802, Cl. 360-96.600.
Sakai, Masayasu: *See*—
Takahashi, Yasuro; and Sakai, Masayasu, 4,329,932, Cl. 110-347.000.
Sakaki, Yorihisa: *See*—
Sawada, Yoshihisa; Komatsu, Fumiaki; Sanada, Kazuo; and Sakaki, Yorihisa, 4,330,698, Cl. 219-10.55A.
Sakamaki, Hisashi: *See*—
Komori, Shigehiro; Sakamaki, Hisashi; Hattori, Hiroyuki; Iida, Toshihide; Miyamoto, Koichi; and Umezawa, Kazumi, 4,330,199, Cl. 355-14.0CH.
Sakata, Kazuhiro: *See*—
Yoneda, Kenji; Nakazato, Masao; Yuminaka, Takeo; Sakata, Kazuhiro; and Kuzunuki, Soshiro, 4,330,838, Cl. 364-580.000.
Sakaue, Yoshikazu; Mitsunaga, Tatsuo; and Kinoshita, Toshihiro, to Mitsubishi Denki Kabushiki Kaisha. Stepped combination apparatus. 4,329,764, Cl. 29-33.00F.
Sakurai, Akira, to Kao Soap Co., Ltd. Tampon. 4,329,991, Cl. 128-263.000.
Sakurai, Hisaya; Katayama, Yoshihiko; Ikegami, Tadashi; and Furusato, Masayasu, to Asahi Kasei Kogyo Kabushiki Kaisha. Polymerization of an α-olefin. 4,330,646, Cl. 526-116.000.
Sakurai, Hisaya; Katayama, Yoshihiko; Ikegami, Tadashi; and Furusato, Masayasu, to Asahi Kasei Kogyo Kabushiki Kaisha. Process for polymerizing α-olefins. 4,330,647, Cl. 526-116.000.
Sakurai, Hisaya; Morita, Hideo; Miya, Masayoshi; Takaya, Katsuhiko; and Yoneda, Haruyuki, to Asahi Kasei Kogyo Kabushiki Kaisha. Catalyst for polymerization of olefins. 4,330,650, Cl. 526-127.000.
Sakurai, Hisaya; Katayama, Yoshihiko; Ikegami, Tadashi; and Furusato, Masayasu, to Asahi Kasei Kogyo Kabushiki Kaisha. Polymerization of α-olefins. 4,330,651, Cl. 526-127.000.
Sakurai, Yoshio; Kataoka, Tateshi; and Oh-hashi, Fujiko, to Asahi Kasei Kogyo Kabushiki Kaisha. N^4-Acylcytosine arabinoside compositions. 4,330,534, Cl. 424-182.000.
Salant, Richard F., to Centrilift-Hughes, Inc. Gas-liquid separator. 4,330,306, Cl. 55-159.000.
Salavetz, Lajos: *See*—
Avar, Zoltan; and Salavetz, Lajos, 4,330,817, Cl. 363-96.000.
Salmon, Claude, to UNIC S.A. Suspension device, for the suspension of a cabin in particular, on the chassis of a vehicle. 4,330,149, Cl. 296-190.000.
Sampson, George P., III, to Bell Telephone Laboratories, Incorporated. Clocked IGFET logic circuit. 4,330,722, Cl. 307-443.000.
Samuelsen, Eirik: *See*—
Alm, Oddvar; Andersen, Bjarne; and Samuelsen, Eirik, 4,330,346, Cl. 149-21.000.
Sanada, Kazuo: *See*—
Sawada, Yoshihisa; Komatsu, Fumiaki; Sanada, Kazuo; and Sakaki, Yorihisa, 4,330,698, Cl. 219-10.55A.
Sander, Ulrich: *See*—
Blumrich, Walter; Dorr, Karl H.; Konig, Hans J.; and Sander, Ulrich, 4,330,364, Cl. 159-47.00R.
Sandoz Ltd.: *See*—
Lindemann, Wolfgang, 4,330,293, Cl. 8-495.000.
Payne, Trevor G., 4,330,555, Cl. 424-309.000.
Wald, Roland, 4,330,294, Cl. 8-643.000.
Sangster, Barrett E.: *See*—
Sangster, Marshall A.; and Sangster, Barrett E., 4,330,050, Cl. 190-51.000.
Sangster, Marshall A.; and Sangster, Barrett E. Portable article carrying case. 4,330,050, Cl. 190-51.000.
Sano, Takezo; Shimomura, Takatoshi; and Sasaki, Masao, to Sumitomo Chemical Company, Limited. Semipermeable membrane and process of making same. 4,330,406, Cl. 210-500.200.
Sanofi: *See*—
Descamps, Marcel; and Goldenberg, Charles, 4,330,542, Cl. 424-248.500.
Santa Barbara Research Center: *See*—
Dye, Richard A., 4,330,204, Cl. 356-152.000.
Santa Fe International Corporation: *See*—
Glasgow, James S., 4,330,225, Cl. 405-160.000.
Richardson, Paul; and Whitley, David A., 4,330,155, Cl. 299-11.000.
Santoro, Giovanni. Gear driving mechanisms changing the last gear thereof upon each reversal of the direction of the motor member. 4,330,098, Cl. 242-201.000.
Sarnoff, Stanley J.; and Lopez, Claudio, to Survival Technology, Inc. Plural injection assembly. 4,329,988, Cl. 128-218.00F.
Sasaki, Masao: *See*—
Sano, Takezo; Shimomura, Takatoshi; and Sasaki, Masao, 4,330,406, Cl. 210-500.200.
Sasaki, Yutaka; Utsumi, Hiroshi; Morii, Akimitsu; and Nakamura, Yoshimi, to Nitto Chemical Industry Co., Ltd. Process for regenerating an antimony containing oxide catalyst. 4,330,429, Cl. 252-413.000.
Sasse, Wolfgang: *See*—
von und zu Aufsess, Friedrich F.; Huxhorn, Gunter; Pohl, Hans; and Sasse, Wolfgang, 4,330,499, Cl. 264-289.600.
Sassler, Marvin L. Apparatus for reducing torque and vibration in racquets. 4,330,125, Cl. 273-73.00C.
Sato, Shiro, to Konishiroku Photo Industry Co., Ltd. Variable magnification projection device. 4,330,179, Cl. 350-422.000.
Sato, Yasushi; Takatori, Yasushi; Hara, Toshitami; and Shirato, Yoshiaki, to Canon Kabushiki Kaisha. Liquid jet recording device. 4,330,787, Cl. 346-140.00R.
Satoh, Ken: *See*—
Kato, Toshikazu; Saitou, Sinichi; Watanabe, Seizo; Nishiyama, Toyoo; Shimdda, Misao; Shibata, Tutomu; Kimura, Kenji; and Satoh, Ken, 4,330,802, Cl. 360-96.600.
Satoh, Seikoh; and Suzuki, Tadashi, to Nissan Motor Company, Limited; and Togawa Rubber Manufacturing Company, Limited. Rubber hose for automotive fuel line. 4,330,017, Cl. 138-126.000.
Satoh, Yoshiyuki; and Higo, Tomio, to Kobe Steel, Ltd. Construction of a heat transfer wall and heat transfer pipe and method of producing heat transfer pipe. 4,330,036, Cl. 165-179.000.
Saudinos, Jean: *See*—
Garin, Arlette; Rouger, Michel; and Saudinos, Jean, 4,330,731, Cl. 313-104.000.
Savage, David S.: *See*—
Sleigh, Thomas; Savage, David S.; and Zeelen, Filippus J., 4,330,539, Cl. 424-238.000.
Sawada, Fred H.; Barton, Sterling C.; Echeverria, Federico S.; and Carson, Chester C., to General Electric Company. Automatic control for processing signals from an overheat monitor of a dynamoelectric machine. 4,330,808, Cl. 361-25.000.
Sawada, Yoshihisa; Komatsu, Fumiaki; Sanada, Kazuo; and Sakaki, Yorihisa, to Doryokuro Kakunenryo Kaihatsu Jigyodan. Microwave melter. 4,330,698, Cl. 219-10.55A.
Scans Associates, Inc.: *See*—
Smith, Richard L.; and Allen, Kent V., 4,330,828, Cl. 364-431.000.
Schaar, Charles H.; Marra, Nicholas A.; Dunn, William J.; and Villari, Frank K., to Kendall Company, The. Scrub sponge. 4,330,220, Cl. 401-134.000.
Schachner, Herbert; Ekemar, Carl S. G.; and Haglund, Bengt O., to Battelle Memorial Institute. Process for the preparation of molybdenum-tungsten carbides. 4,330,332, Cl. 75-203.000.
Schade, Gerhard; and Kuhnrich, Robert, to Dynamit Nobel Aktiengesellschaft. Method of preparing dispersions of crystallizable polyesters of high molecular weight. 4,330,455, Cl. 523-312.000.
Schapker, Joseph G.: *See*—
Tate, Ralph, Jr.; Woods, John T.; and Schapker, Joseph G., 4,330,310, Cl. 62-275.000.
Scharfe, Merlin E.: *See*—
Neyhart, James H.; Brown, George A.; Relyea, Lloyd A.; Scharfe, Merlin E.; and Pinsler, Heinz W., 4,330,609, Cl. 430-126.000.
Scharpenberg, Hans-Georg: *See*—
Kuessner, Klaus; Irnich, Rudolf; Scharpenberg, Hans-Georg; and Volkamer, Klaus, 4,330,305, Cl. 55-48.000.
Schauer, Dennis J.: *See*—
Schauer, John M.; and Schauer, Dennis J., 4,330,510, Cl. 423-210.000.
Schauer, John M.; and Schauer, Dennis J. Method for cleansing noxious constituents from gas streams. 4,330,510, Cl. 423-210.000.
Schaupp, Kurt; Reitz, Gunther; and Boehmke, Gunther, to Bayer Aktiengesellschaft. Modifying mortars of inorganic binding agents with alkylated sulphonated phenol-formaldehyde condensation product. 4,330,334, Cl. 106-90.000.
Scheie, Hugh C.: *See*—
Weir, Donald R.; Kerfoot, Derek G. E.; and Scheie, Hugh C., 4,330,508, Cl. 423-42.000.
Schemmann, Hugo; and Diefenbach, Gerhard, to U.S. Philips Corporation. Shaving apparatus having a shear plate with hair-entry apertures and a cutting unit with lead cutters, which unit is drivable relative to the shear plate. 4,329,781, Cl. 30-34.200.
Schering Aktiengesellschaft: *See*—
Annen, Klaus; Laurent, Henry; Hofmeister, Helmut; Petzoldt, Karl; and Wiechert, Rudolf, 4,330,541, Cl. 424-243.000.
Itil, Turan M.; Laudahn, Gerhard; and Herrmann, Werner M., 4,330,538, Cl. 424-238.000.
Schirmann, Jean-Pierre, to PCUK Produits Chimiques Ugine Kuhlmann. Preparation of percarboxylic acids. 4,330,485, Cl. 260-502.00R.
Schleppinghoff, Bernhard: *See*—
Kohler, Hans-Dieter; and Schleppinghoff, Bernhard, 4,330,679, Cl. 568-697.000.
Schlick -roto-jet Maschinenbau GmbH: *See*—
Kavcic, Marjan, 4,329,818, Cl. 51-422.000.
Schloss, Alden. Extremely sensitive force detector. 4,329,881, Cl. 73-862.080.
Schmalzer, David K.: *See*—
Anderson, Raymond P.; Schmalzer, David K.; and Wright, Charles H., 4,330,388, Cl. 208-8.0LE.
Schmidt, Heinz: *See*—
Zerle, Ludwig; and Schmidt, Heinz, 4,329,838, Cl. 57-1.0UN.
Schmidt, Manfred, to Erich Schultze KG. Alt-Heiligensee 44. Maintenance and protection devices for cooling plants. 4,329,854, Cl. 62-470.000.
Schmidt, Willibald. Apparatus for separating dust, dirt and the like from particulate material. 4,330,400, Cl. 209-474.000.

Schmitt, Frederick L.: *See*—
Boden, Richard M.; Dekker, Lambert; Schmitt, Frederick L.; and Van Loveren, Augustinus G., 4,330,415, Cl. 252-8.600.
Boden, Richard M.; Dekker, Lambert; Schmitt, Frederick L.; and Van Loveren, Augustinus G., 4,330,425, Cl. 252-187.00H.
Schnapper, Christoph: *See*—
Hofmann, Albert; and Schnapper, Christoph, 4,329,849, Cl. 62-55.000.
Schneider, Franz; and Braitinger, Helmut, to L. Schuler GmbH. Safety switching device. 4,330,810, Cl. 361-189.000.
Schneider, Kurt, to Siemens Aktiengesellschaft. Surface protection for parts of a hot-tinning system. 4,330,594, Cl. 428-422.000.
Schnurbusch, Horst: *See*—
Disteldorf, Josef; Flakus, Werner; and Schnurbusch, Horst, 4,330,657, Cl. 528-58.000.
Schranz, Karl-Wilhelm: *See*—
Sobel, Johannes; and Schranz, Karl-Wilhelm, 4,330,606, Cl. 430-17.000.
Schroeder, Dwain R.: *See*—
Russell, Robert C.; Burton, Charles A.; Coleman, Ronald K.; and Schroeder, Dwain R., 4,330,288, Cl. 493-197.000.
Schuessler, Walter E. Protective knitted band for use with safety hats. 4,329,742, Cl. 2-424.000.
Schulz, Ralf-Thilo, to Messerschmitt-Boelkow-Blohm GmbH. Piston and piston rod. 4,329,915, Cl. 92-137.000.
Schulze, Walter A.: *See*—
Shrout, Thomas R.; Schulze, Walter A.; and Biggers, James V., 4,330,593, Cl. 428-407.000.
Schutze, Ronald: *See*—
de Maight, Winfried; and Schutze, Ronald, 4,329,912, Cl. 91-420.000.
Schwabe, Ulrich: *See*—
Jacobs, Erwin; Schwabe, Ulrich; and Takacs, Dezsoe, 4,330,850, Cl. 365-185.000.
Schwarz, Rudolph R.: *See*—
Hannon, Martin J.; Vyas, Rajal M.; and Schwarz, Rudolph R., 4,330,672, Cl. 528-493.000.
Schwefel, Ernst, to Dr. Johannes Heidenhain GmbH. Correction selection device. 4,330,831, Cl. 364-474.000.
Schwerin, Gunter, to Robert Bosch GmbH. Hydraulic regulating device for a working cylinder of an agricultural vehicle. 4,329,911, Cl. 91-387.000.
Schwickert, Russell C.: *See*—
Monaghan, Kevin J.; Schwickert, Russell C.; and Esposito, John J., 4,330,172, Cl. 350-96.210.
Schworer, Emil, to Siegrist, Eugen Josef. Heating boiler. 4,329,943, Cl. 122-17.000.
Schwuger, Milan J.: *See*—
Smolka, Heinz; and Schwuger, Milan J., 4,330,423, Cl. 252-99.000.
Schymick, Michael J. Combined stop and limit switch. 4,330,052, Cl. 192-148.000.
Scott & Fetzer Company, The: *See*—
Ramstrom, Lee W.; and Strnad, Raymond, 4,329,757, Cl. 15-324.000.
Scribner, Albert W. Control system for pneumatic punch press feeders. 4,329,897, Cl. 83-225.000.
Scudder, Roy, to FMC Corporation. Harvesting units. 4,329,836, Cl. 56-330.000.
Scullin, Richard J., Jr., to Mohawk Industries, Inc. Adapter for venting a stove through a fireplace. 4,329,973, Cl. 126-123.000.
Sealer, David A.: *See*—
Dean, Ralph T.; Sealer, David A.; and Hellums, James R., 4,330,769, Cl. 333-165.000.
Sebo, Milan J., to Bendix Corporation, The. Modular control valve. 4,330,157, Cl. 303-7.000.
Secrest, Allen D., to Planter Technology Investments Limited. Self controlled watering planter device. 4,329,815, Cl. 47-80.000.
Sedlatschek, Robert: *See*—
Beckerman, Howard L.; and Sedlatschek, Robert, 4,329,933, Cl. 112-158.00E.
Segawa, Tomio; and Kuramoto, Sakae, to Kawasaki Kasei Chemicals Ltd. Process for producing highly chlorinated copper phthalocyanine. 4,330,470, Cl. 260-245.840.
Seib, Karl: *See*—
Straub, Ferdinand; Hartmann, Heinrich; Naegele, Paul; and Seib, Karl, 4,330,451, Cl. 524-458.000.
Seiko Koki Kabushiki Kaisha: *See*—
Nakagawa, Tadashi, 4,330,187, Cl. 354-195.000.
Seilly, Alec H., to Lucas Industries Limited. Fuel injection system. 4,329,951, Cl. 123-179.00L.
Seki, Shiro: *See*—
Eto, Kunihiko; Seki, Shiro; and Owa, Kaoru, 4,329,771, Cl. 29-568.000.
Sekisui Kagaku Kogyo Kabushiki Kaisha: *See*—
Iwata, Akira; and Fukushima, Shizunobu, 4,330,494, Cl. 264-46.200.
Sekizawa, Hidekazu: *See*—
Iwamoto, Akito; and Sekizawa, Hidekazu, 4,330,775, Cl. 340-146.30P.
Sekmakas, Kazys: *See*—
Killeen, James J.; Plaisance, Thomas H.; and Sekmakas, Kazys, 4,330,445, Cl. 525-501.500.
Selenia Industrie Elettroniche Associate S.p.A.: *See*—
Giustiniani, Piercarlo; and Vincentini, Franco, 4,330,781, Cl. 343-5.0DP.
Selleri, Narciso: *See*—
Possati, Mario; Golinelli, Guido; and Selleri, Narciso, 4,329,782, Cl. 33-147.00K.
Sellers, Ralph F.: *See*—
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Semix Incorporated: *See*—
Lindmayer, Joseph, 4,330,582, Cl. 428-64.000.
Semperit AG: *See*—
Dungl, Willi, 4,329,981, Cl. 128-25.00B.
Seng, Stephen: *See*—
Hohman, Charles M.; Propster, Mark A.; and Seng, Stephen, 4,330,313, Cl. 65-2.000.
Hohman, Charles M.; Propster, Mark A.; and Seng, Stephen, 4,330,316, Cl. 65-27.000.
Propster, Mark A.; Seng, Stephen; and Hohman, Charles, 4,330,314, Cl. 65-27.000.
Sessions, E. Reed, Jr. Portable door lock. 4,330,146, Cl. 292-258.000.
Sethi, Amar J.: *See*—
Yong, Raymond N.; and Sethi, Amar J., 4,330,409, Cl. 210-731.000.
Seto, Junetsu: *See*—
Kawasumi, Kouichi; Watanabe, Haruo; and Seto, Junetsu, 4,330,600, Cl. 428-694.000.
Seto, Yasuhiro: *See*—
Fujikawa, Tetsuzo; Seto, Yasuhiro; Yamamoto, Masaru; and Tanaka, Ichiro, 4,329,948, Cl. 123-73.0AA.
Settle, Edwin B., Jr. Process for making an edible frozen food product. 4,330,563, Cl. 426-389.000.
Shadman, Farhang; and Hegedus, Louis, to General Motors Corporation. Diesel exhaust filter-incinerator. 4,329,844, Cl. 60-311.000.
Shaffer, John W.: *See*—
Brower, Boyd G.; and Shaffer, John W., 4,330,821, Cl. 362-4.000.
Shahin, Majdi M.: *See*—
Bugaut, Andree; Vandenbossche, Jean-Jacques M.; Shahin, Majdi M.; and Kalopissis, Gregoire, 4,330,292, Cl. 8-411.000.
Sharbaugh, John E.: *See*—
Kazan, Joseph M.; Sharbaugh, John E.; and Ritz, William C., 4,330,370, Cl. 376-200.000.
Shasteen, Richard B.: *See*—
Geipel, Henry J., Jr.; and Shasteen, Richard B., 4,329,773, Cl. 29-571.000.
Shaw, Alvin W. Reciprocable storage racks. 4,329,928, Cl. 108-106.000.
Shaw, Peter S.: *See*—
Job, John L.; and Shaw, Peter S., 4,330,667, Cl. 528-266.000.
Sheffield, Marion C.; and Dalier, Paul H., to Drill Services, Inc. Key-seat wiper. 4,330,043, Cl. 175-406.000.
Shefsiek, Paul K., to Holcroft & Company. Ceramic tube recuperator. 4,330,031, Cl. 165-76.000.
Sheinberg, Zena; and Wortman, Alex, to Sheinberg, Zena; and Wortman, Alex. Convertible bowling alley. 4,330,122, Cl. 273-51.000.
Shell, Lewis R.; and Vandevier, Joseph E., to Centrilift-Hughes, Inc. Energizing circuit for providing low voltage starting for submersible pump motor. 4,330,740, Cl. 318-780.000.
Shell Oil Company: *See*—
Allen, Roy A., 4,330,644, Cl. 525-523.000.
Barker, Michael D., 4,330,320, Cl. 71-94.000.
Lieder, Charles A., 4,330,522, Cl. 423-573.00G.
Pott, Gerard T.; and Stuiver, Johannes C. M., 4,330,395, Cl. 208-115.000.
Richardson, Edwin A.; and Fair, Walter B., Jr., 4,330,037, Cl. 166-250.000.
van der Voort, Henricus G. P., 4,330,471, Cl. 548-546.000.
Van Leeuwen, Petrus W. N. M.; and Roobeek, Cornelis F., 4,330,678, Cl. 568-454.000.
Shepherd, Robin G., to John Wyeth & Brother Limited. 3-Aryl-3-aryloxypropylamines. 4,330,546, Cl. 424-263.000.
Shermer, David A.; Jim, Parsons P.; and Laurance, Dale R., to Olin Corporation. Process for clarifying algae-laden waste water stream. 4,330,407, Cl. 210-602.000.
Sherritt Gordon Mines Limited: *See*—
Weir, Donald R.; Kerfoot, Derek G. E.; and Scheie, Hugh C., 4,330,508, Cl. 423-42.000.
Sherwood Medical Industries Inc.: *See*—
Agdanowski, Ronald T., 4,330,497, Cl. 264-150.000.
Sherwood, Robert A., to GTE Automatic Electric Laboratories, Inc. Multichannel subscription television system. 4,330,794, Cl. 358-120.000.
Shibata, Tutomu: *See*—
Kato, Toshikazu; Saitou, Sinichi; Watanabe, Seizo; Nishiyama, Toyoo; Shimdda, Misao; Shibata, Tutomu; Kimura, Kenji; and Satoh, Ken, 4,330,802, Cl. 360-96.600.
Shidara, Keiichi; Goto, Naohiro; Kawamura, Tatsuro; Hiruma, Eikyu; Ikeda, Yohitsumu; Tanioka, Kenkichi; Hirai, Tadaaki; Takasaki, Yukio; Kusano, Chushirou; Uda, Tsuyoshi; and Nonaka, Yasuhiko, to Nippon Hoso Kyokai; and Hitachi, Ltd. Photoconductive target. 4,330,733, Cl. 313-386.000.
Shiley, Inc.: *See*—
Bonchek, Lawrence I., 4,329,985, Cl. 128-214.00R.
Shimano Industrial Company Limited: *See*—
Nagano, Masashi, 4,330,137, Cl. 280-238.000.
Nagano, Masashi, 4,330,286, Cl. 474-164.000.
Shimdda, Misao: *See*—
Kato, Toshikazu; Saitou, Sinichi; Watanabe, Seizo; Nishiyama, Toyoo; Shimdda, Misao; Shibata, Tutomu; Kimura, Kenji; and Satoh, Ken, 4,330,802, Cl. 360-96.600.

Shimizu, Seiichi, to Canon Kabushiki Kaisha. Interchangeable lens assembly for a camera. 4,330,192, Cl. 354-286.000.
Shimomura, Takatoshi: *See—*
Sano, Takezo; Shimomura, Takatoshi; and Sasaki, Masao, 4,330,406, Cl. 210-500.200.
Shin-Etsu Polymer Co., Ltd.: *See—*
Sado, Ryoichi, 4,330,165, Cl. 339-59.00M.
Shinyei Kaisha: *See—*
Kinomoto, Shinichi; Kawamura, Masato; and Kobayashi, Susumu, 4,330,718, Cl. 307-118.000.
Shionogi & Co., Ltd.: *See—*
Ogata, Masaru; and Matsumoto, Hiroshi, 4,330,472, Cl. 548-567.000.
Shirai, Mamoru: *See—*
Kashiwabara, Hirotaka; Shirai, Mamoru; and Inoue, Shinichi, 4,330,770, Cl. 335-112.000.
Shirato, Yoshiaki: *See—*
Sato, Yasushi; Takatori, Yasushi; Hara, Toshitami; and Shirato, Yoshiaki, 4,330,787, Cl. 346-140.00R.
Shlichta, Paul J.: *See—*
United States of America, National Aeronautics and Space Administration; and Shlichta, Paul J., 4,330,359, Cl. 156-608.000.
Shoji, Shigemasa, to TDK Electronics Co., Ltd. Three-piece structure magnetic tape cassette. 4,330,068, Cl. 220-4.00B.
Shrout, Thomas R.; Schulze, Walter A.; and Biggers, James V., to United States of America, Navy. PZT/Polymer composites and their fabrication. 4,330,593, Cl. 428-407.000.
Shu, Frank R.: *See—*
Jain, Chandra P.; and Shu, Frank R., 4,330,296, Cl. 23-230.00B.
Shumaker, John F., to J. I. Case Company. Amplified loader arm. 4,329,797, Cl. 37-118.00R.
Shuman, Bernard E., to Eastern Electrical Equipment Co., Inc. Adjustable display device. 4,329,800, Cl. 40-606.000.
Sibley, Lincoln L., Jr.: *See—*
Kirkpatrick, Robert G.; Snyder, Ronald R.; and Sibley, Lincoln L., Jr., 4,329,907, Cl. 89-12.000.
Sieg, Robert P., to Chevron Research Company. Fluid-contacting process. 4,330,397, Cl. 208-149.000.
Siegel, Hardo: *See—*
Berning, Wilfried; and Siegel, Hardo, 4,330,484, Cl. 260-501.170.
Siegfried Aktiengesellschaft: *See—*
Zirngibl, Ludwig; Fischer, Johanna; and Thiele, Kurt, 4,330,545, Cl. 424-263.000.
Siegrist, Eugen Josef: *See—*
Schworer, Emil, 4,329,943, Cl. 122-17.000.
Siekmeier, David A.; Andersen, Glen L.; Zimmerer, Arthur L., deceased (by Zimmerer, Bernadette, executor); First National Bank and Trust Company, by, executor; and Zimmerer, William P., to Lindsay Manufacturing Company. Laterally mobile irrigation system. 4,330,085, Cl. 239-1.000.
Siemens Aktiengesellschaft: *See—*
Braun, Rudiger, 4,330,820, Cl. 363-135.000.
Grabmaier, Christa; Otto, Franz; and Thomann, Helmut, 4,330,358, Cl. 156-603.000.
Grabmaier, Christa; and Haussuehl, Siegfried, 4,330,524, Cl. 423-593.000.
Jacobs, Erwin; Schwabe, Ulrich; and Takacs, Dezsoe, 4,330,850, Cl. 365-185.000.
Oestreich, Ulrich, 4,330,173, Cl. 350-96.230.
Schneider, Kurt, 4,330,594, Cl. 428-422.000.
Treiber, Dieter; Kling, Adam; and Heider, Ulrich, 4,329,921, Cl. 101-93.020.
Utner, Ferdinand; and Vetter, Harald, 4,329,878, Cl. 73-766.000.
Zeitraeg, Rolf, 4,330,854, Cl. 370-100.000.
Simonidesz, Vilmos; Papp nee Behr, Agnes; Kovacs, Gabor; Ivanics, Jozsef; Der nee Foldvary, Julia; Stadler, Istvan; and Pallagi, Istvan, to Chinoin Gyogyszer es Vegyeszeti Termekek Gyara R.T. 7-Oxo-PGI_2-derivatives and process for the preparation thereof and pharmaceutical compositions containing same. 4,330,553, Cl. 424-285.000.
Simonson, Peter: *See—*
Lachenmeier, Kurt; and Simonson, Peter, 4,330,265, Cl. 432-224.000.
Simpson, Harold G., to Encon Products, Inc. Support spacer apparatus. 4,329,823, Cl. 52-407.000.
Singer Company, The: *See—*
Beckerman, Howard L.; and Sedlatschek, Robert, 4,329,933, Cl. 112-158.00E.
Dotsko, Martin; and Lakshminarayanasetty, Kadam S., 4,330,284, Cl. 434-38.000.
Ferriss, Lincoln S., 4,329,884, Cl. 74-5.60D.
Singer, Karl. Slitter for severing laminated objects. 4,329,896, Cl. 83-210.000.
Sitt, Rudiger: *See—*
Linke, Siegfried; Mardin, Mithat; Krause, Hans P.; and Sitt, Rudiger, 4,330,677, Cl. 562-583.000.
Skandinavisk Tobakskompagni A/S: *See—*
Kjaer, Ian; and Mortensen, Niels E., 4,330,002, Cl. 131-365.000.
Skelly, Michael. Multiple flow and directional control valve. 4,330,008, Cl. 137-596.130.
SKF Kugellagerfabriken GmbH: *See—*
Stolz, Robert; and Neder, Gunter, 4,330,160, Cl. 308-201.000.
Sleigh, Thomas; Savage, David S.; and Zeelen, Filippus J., to Akzo nv. Novel 17-amino-16-hydroxy steroids of the androstane and oestrane series and derivatives thereof. 4,330,539, Cl. 424-238.000.
Sloan, Frank: *See—*
Wilson, Wilfred W., 4,330,082, Cl. 236-13.000.
Smiser, Laurence W.: *See—*
United States of America, National Aeronautics and Space Administration; Holt, Jack W.; Helman, Donald D.; and Smiser, Laurence W., 4,330,572, Cl. 427-140.000.
Smith International, Inc.: *See—*
Hampton, J. E., 4,330,140, Cl. 285-39.000.
Smith-Johannsen, Robert: *See—*
Horsma, David A.; Lyons, Bernard J.; and Smith-Johannsen, Robert, 4,330,703, Cl. 219-553.000.
Smith, Otto J. M. Wind turbine system. 4,330,714, Cl. 290-55.000.
Smith, Richard E.; and Yonovich, John R., to Xerox Corporation. Recirculating documents duplex copier. 4,330,197, Cl. 355-14.0SH.
Smith, Richard L.; and Allen, Kent V., to Scans Associates, Inc. Method of controlling production processes and apparatus therefor. 4,330,828, Cl. 364-431.000.
Smith, Stanley B., Jr.: *See—*
Dennison, Allan G., Jr.; Smith, Stanley B., Jr.; Fonteyn, Robert A.; and Jarratt, Robert V., Jr., 4,330,776, Cl. 340-365.00R.
Smolik, Kenneth F., to Bell Telephone Laboratories, Incorporated. Signal characteristic state detector using interval-count processing method. 4,330,862, Cl. 375-75.000.
Smolka, Heinz; and Schwuger, Milan J., to Henkel Kommanditgesellschaft auf Aktien. Process for the production of solid, pourable washing or cleaning agents with a content of a calcium binding silicate. 4,330,423, Cl. 252-99.000.
Sneider, Vincent R. Expanding swab applicator. 4,329,990, Cl. 128-239.000.
Snyder, Ronald R.: *See—*
Kirkpatrick, Robert G.; Snyder, Ronald R.; and Sibley, Lincoln L., Jr., 4,329,907, Cl. 89-12.000.
Sobel, Johannes; and Schranz, Karl-Wilhelm, to AGFA-Gevaert AG. Color photographic materials and color photographic images. 4,330,606, Cl. 430-17.000.
Socapex: *See—*
Malsot, Christian; and Badoz, Jean-Marie, 4,330,171, Cl. 350-96.210.
Sochor, Josef: *See—*
Foerster, Hubert; and Sochor, Josef, 4,330,795, Cl. 358-127.000.
Societa Italiana Telecomunicazioni Siemens S.p.A.: *See—*
Busacca, Guido; Meli, Vincenzo; and Rossi, Antonio, 4,330,760, Cl. 331-55.000.
Societe Anonyme dite: Compagnie Generale d'Electricite: *See—*
Robieux, Jean, 4,330,869, Cl. 455-607.000.
Societe d'Assistance Technique pour Produits Nestle S.A.: *See—*
Olsson, Sven, 4,329,761, Cl. 17-71.000.
Societe de Prayon: *See—*
Davister, Armand L., 4,330,404, Cl. 210-247.000.
Societe Europeenne des Produits Refractaires: *See—*
Jeanvoine, Pierre L.; and Gardiol, Maurice, 4,330,630, Cl. 501-105.000.
Societe National des Poudres et Explosifs: *See—*
Lebas, Jean-Marie; Rat, Pierre; Dupont, Jean-Marcel; and Vinuesa, Germain, 4,330,251, Cl. 425-405.00H.
Societe Nationale d'Etude et de Construction de Moteurs d'Aviation: *See—*
Caruel, Jacques E. J.; Gastebois, Philippe M. D.; and Coutor, Simone, 4,329,848, Cl. 60-757.000.
Societe Nationale Elf Aquitaine: *See—*
Astruc, Michel; Guyomar, Pierre-Yves; and Lestrade, Catherine, 4,330,387, Cl. 204-275.000.
Sogo, Hiroshi; and Yoshino, Nobuo, to Fuji Jukogyo Kabushiki Kaisha. System for guiding flying vehicles with light beam. 4,330,099, Cl. 244-3.130.
Solie, Leland P., to Sperry Corporation. Surface acoustic wave coupling with respect to non-piezoelectric substrates. 4,330,728, Cl. 310-313.00B.
Solvay & Cie: *See—*
Glineur, Willy, 4,330,521, Cl. 423-473.000.
Somers, M. John, to Dayco Corporation. Method of making a reinforced wear-resistant liner. 4,329,780, Cl. 29-848.000.
Sommer, Werner: *See—*
Becker, Udo; Busch, Wolfram; Fischer, Johann P.; and Sommer, Werner, 4,329,992, Cl. 128-272.000.
Sonobe, Hisao: *See—*
Okada, Sadayuki; and Sonobe, Hisao, 4,330,033, Cl. 165-104.270.
Sony Corporation: *See—*
Kawasumi, Kouichi; Watanabe, Haruo; and Seto, Junetsu, 4,330,600, Cl. 428-694.000.
Sorkin, Jack L.: *See—*
Thomas, Daniel C.; and Sorkin, Jack L., 4,330,611, Cl. 430-156.000.
Sorwick, Jack R., to Technicare Corporation. Mechanical sector scanner head and power train. 4,330,874, Cl. 367-103.000.
Soukup, Charles L.; and Kerr, Richard K., to Zimpro-AEC Ltd. Oil reclamation process. 4,330,038, Cl. 166-267.000.
Southco, Inc.: *See—*
Bisbing, Robert H., 4,330,145, Cl. 292-37.000.
Sowder, Douglas A.: *See—*
Sowder, Tony R.; and Sowder, Douglas A., 4,329,926, Cl. 104-179.000.
Sowder, Tony R.; and Sowder, Douglas A. Biased sheave frame for aerial tram. 4,329,926, Cl. 104-179.000.
Spaida, Hans P.: *See—*
Pietschmann, Frank; John, Gunter; Eistert, Theodor; Noack, Christian; Oliva, Klaus; Zumpe, Bernd; Spaida, Hans P.; Boltizar, Pal; Fabry, Istvan; Vida, Csongor; Lakos, Lajos; and Klement, Matjas, 4,329,832, Cl. 56-98.000.

Spence, John R.: *See—*
Fattore, James T., Jr.; Fattore, Robert L.; Angevine, William R.; and Spence, John R., 4,330,184, Cl. 354-81.000.

Sperry Corporation: *See—*
Price, Robert, 4,330,799, Cl. 360-40.000.
Pucher, Richard A., 4,329,835, Cl. 56-320.100.
Solie, Leland P., 4,330,728, Cl. 310-313.00B.

Spiers, Steven F.: *See—*
Grollimund, Everett C.; and Spiers, Steven F., 4,330,356, Cl. 156-446.000.

Spin Physics, Inc.: *See—*
Lemke, James U., 4,330,807, Cl. 360-119.000.

Spinelli, Harry J.; and Thompson, Alan L., to Du Pont de Nemours, E. I., and Company. High solids coating composition of a blend of a low molecular weight acrylic polymer and a medium molecular weight acrylic polymer and an alkylated melamine cross-linking agent. 4,330,458, Cl. 524-512.000.

Sprecker, Mark A., to International Flavors & Fragrances Inc. Norbornyl ethers. 4,330,416, Cl. 252-8.900.

Springer, Edward M.: *See—*
Heyer, Arthur J.; Springer, Edward M.; and Clay, Wallace C., 4,330,798, Cl. 358-291.000.

Springer, Helmut: *See—*
Kranzl, Franz A.; and Springer, Helmut, 4,330,262, Cl. 432-3.000.

Spurry, Roderick H., to Plessey Overseas Limited. Gear pump with pressure loaded bearing blocks and separate gear sealing plates. 4,330,241, Cl. 418-132.000.

Srostlik, Peter: *See—*
Ahner, Stefan; Christ, Richard; Klein, Dieter; and Srostlik, Peter, 4,330,711, Cl. 250-506.000.

Stadler, Istvan: *See—*
Simonidesz, Vilmos; Papp nee Behr, Agnes; Kovacs, Gabor; Ivanics, Jozsef; Der nee Foldvary, Julia; Stadler, Istvan; and Pallagi, Istvan, 4,330,553, Cl. 424-285.000.

Stal-Laval Turbin AB: *See—*
Rastrom, Arne, 4,329,847, Cl. 60-648.000.

Stanadyne, Inc.: *See—*
Moen, Alfred M., 4,330,011, Cl. 137-625.170.

Standard Oil Company (Indiana): *See—*
Balint, Nikolaous K., 4,330,431, Cl. 252-429.00B.
Bertolacini, Ralph J.; Kim, Dae K.; and Lehmann, Gerald M., 4,330,435, Cl. 252-455.00Z.

Stange, Klaus K., to Xerox Corporation. Development system. 4,330,193, Cl. 355-3.0DD.

Stanley, Gerald R., to Crown International, Inc. Thermal protection circuit for the die of a transistor. 4,330,809, Cl. 361-103.000.

Staron, Thadee J., to Institut National de la Recherche Agronomique. Process for producing food proteins of fungal origin or from multicellular organisms fementation apparatus and proteins so-produced. 4,330,560, Cl. 426-7.000.

Staroselsky, Alexandr A.: *See—*
Kostandov, Leonid A.; Enikolopov, Nikolai S.; Dyachkovsky, Fridrikh S.; Novokshonova, Ljudmila A.; Gavrilov, Jury A.; Kudinova, Olga I.; Maklakova, Tatyana A.; Akopian, Leonid A.; Mchedlov-Petrosian, Otar P.; Boilko, Mikhail I.; Staroselsky, Alexandr A.; and Tkachenko, Vladimir P., 4,330,573, Cl. 427-213.000.

Stauffer Chemical Company: *See—*
Grimes, Whiteford; and Lombardi, Ronald A., 4,330,352, Cl. 156-235.000.

Steel Founder's Society of America: *See—*
Wallace, John F., 4,330,024, Cl. 164-56.100.

Stein, Dieter: *See—*
Juza, Dirk; and Stein, Dieter, 4,330,645, Cl. 526-61.000.

Steinlein, Frederick R.: *See—*
Doshi, Mahendra F.; Gruber, Martin V.; and Steinlein, Frederick R., 4,330,491, Cl. 261-111.000.

Stella KG Werner Deussen: *See—*
Deussen, Werner, 4,330,067, Cl. 215-220.000.

Stellram S.A.: *See—*
Raye, Pierre; Jaquiery, Henri; and Gehri, Hermann, 4,330,227, Cl. 407-36.000.

Stemme, Otto; Wagensonner, Eduard; and Ruf, Wolfgang, to AGFA-Gevaert Aktiengesellschaft. Electronic scanning of super-8 films for reproduction on a T.V. viewing unit. 4,330,793, Cl. 358-56.000.

Stephan, Hans-Werner: *See—*
Lehr, Klaus; Heymer, Gero; Stephan, Hans-Werner; and Thummler, Ursus, 4,330,504, Cl. 422-205.000.

Stephens, James B.: *See—*
Miller, Charles G.; and Stephens, James B., 4,330,177, Cl. 350-311.000.

Sterel, Willem, to Sulzer Brothers Ltd. Shuttle return conveyor mechanism. 4,330,018, Cl. 139-439.000.

Sterlini, Jacques, to CEM Compagnie Electro-Mecanique. Process for separating a gas and a condensable vapor. 4,329,788, Cl. 34-27.000.

Stetter, Jorg: *See—*
Kraatz, Udo; Buchel, Karl H.; Stetter, Jorg; Frohberger, Paul-Ernst; and Brandes, Wilhelm, 4,330,547, Cl. 424-263.000.

Stewart, John K., Jr.: *See—*
Gulett, Michael R.; Trudel, Murray L.; and Stewart, John K., Jr., 4,330,569, Cl. 427-38.000.

Stewart, Wilber C.; and Alphonse, Gerard A., to RCA Corporation. Apparatus for monitoring a wideband electromechanical recording system. 4,330,882, Cl. 369-55.000.

Stoll, Brigitte: *See—*
Lautenschlager, Hans-Heiner; Betzing, Hans; and Stoll, Brigitte, 4,330,550, Cl. 424-273.00R.

Stolz, Robert; and Neder, Gunter, to SKF Kugellagerfabriken GmbH. Bearing cage, in particular for two-row angular contact ball bearings. 4,330,160, Cl. 308-201.000.

Stolzer, Paul, to Keuro Maschinenbau Gesellschaft mit beschrankter Haftung & Kommanditgesellschaft. Cutting machine. 4,329,894, Cl. 83-156.000.

Stone, Louis P.: *See—*
Tyler, Derek E.; Cheskis, Harvey P.; Stone, Louis P.; and Pryor, Michael J., 4,330,328, Cl. 75-76.000.

Stork PMT BV: *See—*
van Mil, Martinus P. G., 4,329,760, Cl. 17-11.10R.

Stout, Daniel W.; and McGinnes, Paul R., to Synergetics Co. Therapeutic method. 4,330,551, Cl. 424-273.00R.

Stovall, Philip H.; and Webber, Robert C., to Lockheed Corporation. Method of applying corrosion preventive coating to metallic cable. 4,330,571, Cl. 427-120.000.

Straub, Ferdinand; Hartmann, Heinrich; Naegele, Paul; and Seib, Karl, to BASF Aktiengesellschaft. Preparation of a polyvinylpyrrolidone by heat treatment of an aqueous solution of a conventional polyvinylpyrrolidone. 4,330,451, Cl. 524-458.000.

Strauchler, Irving D.: *See—*
Alexander, Harold; Parsons, John R.; Strauchler, Irving D.; and Weiss, Andrew B., 4,329,743, Cl. 3-1.000.

Strelkov, Valentin V.: *See—*
Kuznetsov, Lev B.; Strelkov, Valentin V.; Zaitsev, Anatoly V.; Lvov, Igor A.; and Romanova, Valentina P., 4,329,868, Cl. 73-19.000.

Strnad, Raymond: *See—*
Ramstrom, Lee W.; and Strnad, Raymond, 4,329,757, Cl. 15-324.000.

Stroud, Brian T., to CAE Machinery Ltd. Elastomeric strain system for bandmills. 4,329,901, Cl. 83-819.000.

Stroud, Lebern W.; and Everett, Jack E. Automatic feedback system. 4,330,715, Cl. 307-10.00R.

Struck, Bernd D.: *See—*
Boltersdorf, Dagmar; Junginger, Robert; Struck, Bernd D.; and Neumeister, Herbert, 4,330,378, Cl. 204-104.000.

Stucke, Arthur W.: *See—*
George, Mark S.; and Stucke, Arthur W., 4,330,097, Cl. 242-187.000.

Stuiver, Johannes C. M.: *See—*
Pott, Gerard T.; and Stuiver, Johannes C. M., 4,330,395, Cl. 208-115.000.

Stulting, Roy M.; and Attwood, Stanley W., to Motorola Inc. Method and apparatus for measuring received Doppler cycles for a specified period of time. 4,330,746, Cl. 324-78.00D.

Stumm, James E. High stability structural joint, device and method. 4,330,221, Cl. 403-218.000.

Su, Tien-Kuei: *See—*
Kluger, Edward W.; and Su, Tien-Kuei, 4,330,660, Cl. 528-111.000.

Sublett, Bobby J., to Eastman Kodak Company. Copolyester adhesives. 4,330,670, Cl. 528-302.000.

Suey, Paul V. Insulating tile for reheating furnaces. 4,330,266, Cl. 432-234.000.

Sugihara, Hirosada; Watanabe, Masazumi; Kawada, Mitsuru; and Imada, Isuke, to Takeda Chemical Industries, Ltd. Spirobenzofuranone compounds. 4,330,554, Cl. 424-285.000.

Sugiura, Nobuo: *See—*
Yanaihara, Noboru; and Sugiura, Nobuo, 4,330,466, Cl. 260-112.50R.

Suhey, Richard P.: *See—*
Noll, Burton A.; and Suhey, Richard P., 4,330,029, Cl. 165-8.000.

Sulzer Brothers Ltd.: *See—*
Sterel, Willem, 4,330,018, Cl. 139-439.000.

Sumitomo Chemical Company, Limited: *See—*
Sano, Takezo; Shimomura, Takatoshi; and Sasaki, Masao, 4,330,406, Cl. 210-500.200.
Suzuki, Tomokazu; Hayashi, Akira; and Yamamura, Yuichi, 4,330,558, Cl. 424-319.000.

Sumitomo Electric Industries, Ltd.: *See—*
Miyamoto, Yoshimi; Toriumi, Yasuo; and Kojima, Keiichi, 4,330,493, Cl. 264-22.000.

Sumitomo Light Metal Industries, Ltd.: *See—*
Terai, Shiro; Amitani, Toshio; Suzuki, Toshio; Hirata, Katsuhiko; and Andoh, Makoto, 4,330,344, Cl. 148-6.200.

Sun, James H., to Atlantic Richfield Company. Heater damper controller. 4,330,261, Cl. 431-14.000.

Suncor Inc.: *See—*
Yong, Raymond N.; and Sethi, Amar J., 4,330,409, Cl. 210-731.000.

Sundstrand Corporation: *See—*
Glennon, Timothy F., 4,330,743, Cl. 322-10.000.

Sunkist Growers, Inc.: *See—*
Conway, Tim D.; and Paddock, Paul F., 4,330,062, Cl. 209-582.000.

Survival Technology, Inc.: *See—*
Sarnoff, Stanley J.; and Lopez, Claudio, 4,329,988, Cl. 128-218.00F.

Suzuki, Katsunori: *See—*
Nagase, Hiroshi; Okuyama, Toshiaki; Kubota, Yuzuru; and Suzuki, Katsunori, 4,330,741, Cl. 318-803.000.

Suzuki, Keizo: *See—*
Okudaira, Sadayuki; Suzuki, Keizo; Nishimatsu, Shigeru; and Kanomata, Ichiro, 4,330,384, Cl. 204-192.00E.

Suzuki, Sadao, to Yoshino Kogyosho Co., Ltd. Orientation-blow molding equipment and jig used therefor. 4,330,255, Cl. 425-529.000.

Suzuki, Tadashi: *See*—
Satoh, Seikoh; and Suzuki, Tadashi, 4,330,017, Cl. 138-126.000.
Suzuki, Tomokazu; Hayashi, Akira; and Yamamura, Yuichi, to Sumitomo Chemical Company, Limited; Suzuki, Tomokazu; Hayashi, Akira; and Yamamura, Yuichi. Pharmaceutical composition and method for treating peripheral orthostatic hypotension. 4,330,558, Cl. 424-319.000.
Suzuki, Toshio: *See*—
Terai, Shiro; Amitani, Toshio; Suzuki, Toshio; Hirata, Katsuhiko; and Andoh, Makoto, 4,330,344, Cl. 148-6.200.
Swain, Richard, to Norlin Industries, Inc. Programmable frequency and duty cycle tone signal generator. 4,330,751, Cl. 328-61.000.
Swift, Joseph A.; Ray, C. Michael; and Ewing, Joan R., to Xerox Corporation. Method for preparing conductive fiber brushes. 4,330,349, Cl. 156-72.000.
Swisher Associates: *See*—
McCafferty, James, 4,330,121, Cl. 273-26.00B.
Swisher, Scott N.; Barnett, Richard E.; and Griner, Paul K., to Motorola, Inc. Synchronized frequency synthesizer with high speed lock. 4,330,758, Cl. 331-1.00A.
Swithenbank, Colin: *See*—
Bayer, Horst O.; Swithenbank, Colin; and Yih, Roy Y., 4,330,324, Cl. 71-105.000.
Sylvan, Richard: *See*—
Ferdinand, Irwin J.; Sylvan, Richard; and Peterson, Michael, 4,330,113, Cl. 269-88.000.
Synergetics Co.: *See*—
Stout, Daniel W.; and McGinnes, Paul R., 4,330,551, Cl. 424-273.00R.
Syntex (U.S.A.) Inc.: *See*—
Nash, John E., 4,330,282, Cl. 433-118.000.
Szablikowski, Klaus: *See*—
Bohmer, Branislaw; Hoppe, Lutz; Szablikowski, Klaus; Kudora, Dieter; and Behn, Rudolf, 4,330,441, Cl. 525-54.230.
Szporny, Laszlo: *See*—
Nyeki, Olga; Kisfaludy, Lajos; Karpati, Egon; and Szporny, Laszlo, 4,330,532, Cl. 424-177.000.
Tachita, Ryobun; and Fukukita, Hiroshi, to Matsushita Electric Industrial Company, Limited. Focusing circuit for ultrasound imaging system. 4,330,875, Cl. 367-105.000.
Takacs, Dezsoe: *See*—
Jacobs, Erwin; Schwabe, Ulrich; and Takacs, Dezsoe, 4,330,850, Cl. 365-185.000.
Takada, Masami, to Nippon Electric Co., Ltd. Automatic gain control circuit in multi-direction time division multiplex communication system. 4,330,859, Cl. 370-113.000.
Takagi, Kazumasa: *See*—
Hashimoto, Atsumi; and Takagi, Kazumasa, 4,330,782, Cl. 343-715.000.
Takahashi, Akira; and Takikawa, Toru, to Kabushiki Kaisha Osaka Packing Seizosho. Novel amorphous silica. 4,330,519, Cl. 423-335.000.
Takahashi, Hideo; Igi, Keishiro; Ogawara, Hisashi; and Nakayasu, Haruo, to Kuraray Company, Ltd. Method of manufacturing foundry sand molds. 4,330,459, Cl. 523-148.000.
Takahashi, Yasuro; and Sakai, Masayasu, to Mitsubishi Jukogyo Kabushiki Kaisha. Method of burning fuel with lowered nitrogen-oxides emission. 4,329,932, Cl. 110-347.000.
Takanashi, Itsuo: *See*—
Yokokawa, Sumio; Takanashi, Itsuo; Miyoshi, Tadayoshi; Nakagaki, Shintaro; Motoyama, Koichiro; and Miyazaki, Kenichi, 4,330,797, Cl. 358-224.000.
Takanori, Seno: *See*—
Wada, Ryoichi; Mitsuharu, Tsuchiya; and Takanori, Seno, 4,330,860, Cl. 371-37.000.
Takara Co., Ltd.: *See*—
Terui, Masumi, 4,329,810, Cl. 46-206.000.
Takasaki, Yasuto: *See*—
Konishi, Jirou; Takasaki, Yasuto; Ohkoshi, Kenji; Ozeki, Akichika; Kajikawa, Shuji; and Itoh, Haruo, 4,330,264, Cl. 432-77.000.
Takasaki, Yoshitaka; and Yoshine, Hiroki, to Hitachi, Ltd. Digital signal transmission system including means for converting asynchronous signals to the operating speed of a transmission line. 4,330,856, Cl. 370-102.000.
Takasaki, Yukio: *See*—
Shidara, Keiichi; Goto, Naohiro; Kawamura, Tatsuro; Hiruma, Eikyu; Ikeda, Yohitsumu; Tanioka, Kenkichi; Hirai, Tadaaki; Takasaki, Yukio; Kusano, Chushirou; Uda, Tsuyoshi; and Nonaka, Yasuhiko, 4,330,733, Cl. 313-386.000.
Takatori, Yasushi: *See*—
Sato, Yasushi; Takatori, Yasushi; Hara, Toshitami; and Shirato, Yoshiaki, 4,330,787, Cl. 346-140.00R.
Takaya, Katsuhiko: *See*—
Sakurai, Hisaya; Morita, Hideo; Miya, Masayoshi; Takaya, Katsuhiko; and Yoneda, Haruyuki, 4,330,650, Cl. 526-127.000.
Takayama, Syuichi, to Olympus Optical Co., Ltd. Photographing apparatus for endoscope. 4,330,189, Cl. 354-202.000.
Takayama, Yoshihiro; Endo, Fujio; Nozawa, Tsuneo; Masuda, Yoshiro; Mori, Motokuni; and Kanayama, Toshiji, to Mitsubishi Petrochemical Co., Ltd.; and Mitsubishi Yuka Pharmaceutical Co., Ltd. Novel polysaccharide and hypocholesterol composition containing the same. 4,330,533, Cl. 424-181.000.
Takeda Chemical Industries, Ltd.: *See*—
Sugihara, Hirosada; Watanabe, Masazumi; Kawada, Mitsuru; and Imada, Isuke, 4,330,554, Cl. 424-285.000.
Tanaka, Michio; Nasu, Kohji; and Kanemoto, Tetsuaki, 4,330,595, Cl. 428-425.500.
Takei, Yasuharu, to Fumakilla Limited. Thermoevaporative insecticidal apparatus and a container assembly used therein. 4,330,506, Cl. 422-305.000.
Takemoto, Osafumi: *See*—
Yamazaki, Kazuo; Nomura, Katsumi; and Takemoto, Osafumi, 4,330,778, Cl. 340-642.000.
Takenaka, Yoshinori; Tsuda, Nobuaki; and Kuroda, Toru, to Asahi Kasei Kogyo Kabushiki Kaisha. Separation of leukocytes from leukocyte-containing suspension by filtration. 4,330,410, Cl. 210-767.000.
Takeshita, Michitaka: *See*—
Tsukamoto, Takehiro; Takeshita, Michitaka; and Tomita, Seisuke, 4,330,592, Cl. 428-378.000.
Takeuchi, Tetsuya: *See*—
Arima, Teruo; Machii, Kenji; Chikazawa, Nobumoto; Takeuchi, Tetsuya; and Fujii, Setsuro, 4,330,527, Cl. 424-94.000.
Takikawa, Toru: *See*—
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Tamura, Kikuo: *See*—
Hashimoto, Noriyoshi; Ito, Mikio; and Tamura, Kikuo, 4,330,209, Cl. 356-328.000.
Hashimoto, Noriyoshi; Ito, Mikio; and Tamura, Kikuo, 4,330,210, Cl. 356-328.000.
Tanaka, Chihaya: *See*—
Yabuta, Kenji; Tosa, Senji; Oiri, Yasuhiko; and Tanaka, Chihaya, 4,330,785, Cl. 346-1.100.
Tanaka Denshi Kogyo Kabushiki Kaisha: *See*—
Hayashi, Shozo; and Tomiyama, Susumu, 4,330,329, Cl. 420-511.000.
Tanaka, Ichiro: *See*—
Fujikawa, Tetsuzo; Seto, Yasuhiro; Yamamoto, Masaru; and Tanaka, Ichiro, 4,329,948, Cl. 123-73.0AA.
Tanaka, Kazuo, to Canon Kabushiki Kaisha. Zoom lens system having a plural number of relay lenses. 4,330,180, Cl. 350-427.000.
Tanaka, Michio; Nasu, Kohji; and Kanemoto, Tetsuaki, to Takeda Chemical Industries, Ltd. Method for protecting cementware from frost-damage. 4,330,595, Cl. 428-425.500.
Tanioka, Kenkichi: *See*—
Shidara, Keiichi; Goto, Naohiro; Kawamura, Tatsuro; Hiruma, Eikyu; Ikeda, Yohitsumu; Tanioka, Kenkichi; Hirai, Tadaaki; Takasaki, Yukio; Kusano, Chushirou; Uda, Tsuyoshi; and Nonaka, Yasuhiko, 4,330,733, Cl. 313-386.000.
Tashiro, Mituru; Harita, Yoshiyuki; and Harada, Kunihiro, to Japan Synthetic Rubber Co., Ltd. Laminate of monolayer film of cyclized butadiene polymer and other photosensitive layer. 4,330,612, Cl. 430-286.000.
Tate, Ralph, Jr.; Woods, John T.; and Schapker, Joseph G., to Whirlpool Corporation. Plastic mullion rail assembly for refrigerator. 4,330,310, Cl. 62-275.000.
Tatsumi, Susumu: *See*—
Eda, Tadahiro; Tatsumi, Susumu; and Imai, Chikara, 4,330,749, Cl. 324-457.000.
Taylor, James W.; and Romero, Romer A., to Wisconsin Alumni Research Foundation. Microwave discharge degradation of organics for analysis. 4,330,295, Cl. 23-230.00M.
Taylor, Robert C.: *See*—
Gambino, Richard J.; and Taylor, Robert C., 4,330,848, Cl. 365-32.000.
Taylor, William F., to Exxon Research & Engineering Co. High thermal stability liquid hydrocarbons and methods for producing them. 4,330,302, Cl. 44-63.000.
Tazuma, James J.: *See*—
Keck, Max H.; Gloth, Richard E.; and Tazuma, James J., 4,330,462, Cl. 524-331.000.
TDK Electronics Co., Ltd.: *See*—
Shoji, Shigemasa, 4,330,068, Cl. 220-4.00B.
Technicare Corporation: *See*—
Sorwick, Jack R., 4,330,874, Cl. 367-103.000.
Tecumseh Products Company: *See*—
Gannaway, Edwin L., 4,330,239, Cl. 417-312.000.
Teijin Limited: *See*—
Yoshisato, Eishin; Azuma, Shizuo; and Yamaji, Teizo, 4,330,633, Cl. 501-152.000.
Teijin Seiki Company Limited: *See*—
Fukui, Kiyozumi, 4,330,051, Cl. 192-3.00N.
Tejera, Enrique; Currie, Sara A.; Flor, James E.; and Monaghan, Richard L., to Merck & Co., Inc. Process for producing Tunicamycin. 4,330,624, Cl. 435-75.000.
Teledyne Hanau: *See*—
Beu, Richard A., 4,330,277, Cl. 433-73.000.
Teltone Corporation: *See*—
Foulkes, John D.; Worthington, David K.; and Trombly, John E., 4,330,687, Cl. 179-2.0DP.
Terada, Masaaki, to Olympus Optical Co., Ltd. Flexible sheath for an endoscope. 4,329,980, Cl. 128-4.000.
Terai, Shiro; Amitani, Toshio; Suzuki, Toshio; Hirata, Katsuhiko; and Andoh, Makoto, to Sumitomo Light Metal Industries, Ltd. Selective absorber of solar energy and process for producing same. 4,330,344, Cl. 148-6.200.
Terasawa, Yoshio: *See*—
Oikawa, Saburo; Murakami, Susumu; and Terasawa, Yoshio, 4,329,772, Cl. 29-571.000.
Terneu, Robert: *See*—
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Terui, Masumi, to Takara Co., Ltd. Coin weighted toy racing car. 4,329,810, Cl. 46-206.000.
Teruo, Takiguchi: *See—*
Hideo, Sato; Teruo, Takiguchi; Norio, Akimoto; and Ikuo, Ueno, 4,330,668, Cl. 528-271.000.
Tesch, Sheila A., to Minnesota Mining and Manufacturing Company. Treating composition containing white oil. 4,330,422, Cl. 252-89.100.
Tessler, Martin M., to National Starch and Chemical Corporation. Paper containing cationic starch graft copolymers from starch, N,N'-methylenebisacrylamide, and polyamines. 4,330,365, Cl. 162-168.0NA.
Texaco Inc.: *See—*
Cummings, William M.; and Powell, Justin C., 4,330,303, Cl. 44-63.000.
LeBoeuf, Harry P., 4,330,402, Cl. 210-170.000.
Nolting, Jerry L.; and Muller, Ralph C., 4,329,875, Cl. 73-290.00V.
White, William R.; and Reale, John, Jr., 4,330,420, Cl. 252-32.70E.
Texas Instruments Incorporated: *See—*
Redwine, Donald J.; White, Lionel S., Jr.; and Rao, G. R. Mohan, 4,330,852, Cl. 365-221.000.
White, Lionel S., Jr., 4,330,851, Cl. 365-202.000.
Thermo King Corporation: *See—*
Havemann, Robert K., 4,329,957, Cl. 123-378.000.
Thiel, Max: *See—*
Friebe, Walter-Gunar; Winter, Werner; Thiel, Max; Roesch, Androniki; and Wilhelms, Otto-Henning, 4,330,549, Cl. 424-267.000.
Thiele, Kurt: *See—*
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Thomann, Helmut: *See—*
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Thomas, Daniel C.; and Sorkin, Jack L., to Richardson Graphics Company. Lithographic plate and photoresist having photosensitive layers of diazo and cinnamoylated polyvinyl alcohol materials. 4,330,611, Cl. 430-156.000.
Thomas, Michael D.; and Ryder, Francis E., to Ryder International Corporation. Testing tray. 4,330,627, Cl. 435-301.000.
Thompson, Alan L.: *See—*
Spinelli, Harry J.; and Thompson, Alan L., 4,330,458, Cl. 524-512.000.
Thomson-CSF: *See—*
Calligaro, Michel, 4,329,774, Cl. 29-583.000.
de Chambost, Emmanuel, 4,330,709, Cl. 250-396.0ML.
Moreau, Jean M., 4,330,756, Cl. 330-297.000.
Thorn, Ake, to Masonite AB. Roofing elements. 4,329,827, Cl. 52-793.000.
Thorn EMI Limited: *See—*
Bennett, Maurice R., 4,330,789, Cl. 346-161.000.
Hing, Peter; and Khan, Ehsan U., 4,330,629, Cl. 501-47.000.
Thornton, Craig E. Cake plate with message concealing compartment. 4,330,060, Cl. 206-459.000.
Thummler, Ursus: *See—*
Lehr, Klaus; Heymer, Gero; Stephan, Hans-Werner; and Thummler, Ursus, 4,330,504, Cl. 422-205.000.
Thuries, Edmond; Sadoulet, Jean-Paul; and Dufournet, Denis, to Delle-Alsthom. Earthquake protector. 4,330,103, Cl. 248-548.000.
Thym, Sabine: *See—*
Acker, Rolf-Dieter; Buschmann, Ernst; Thym, Sabine; Zeeh, Bernd; and Pommer, Ernst-Heinrich, 4,330,535, Cl. 424-184.000.
Tidstrom, Erling, to Aktiebolaget Bofors. Feeding device for rounds in self-propelled gun. 4,329,909, Cl. 89-46.000.
Timberlake, John F.; Baugh, Daniel W., Jr.; and Burkes, Bobby, to Dow Chemical Company, The. Process for preparing polycarbonates. 4,330,481, Cl. 260-463.000.
Tiribelli, Paolo, to CSELT - Centro Studi e Laboratori Telecomunicazioni S.p.A. System for statistical supervision of trunk-dialed long-distance telephone calls. 4,330,688, Cl. 179-8.00A.
Tkachenko, Vladimir P.: *See—*
Kostandov, Leonid A.; Enikolopov, Nikolai S.; Dyachkovsky, Fridrikh S.; Novokshonova, Ljudmila A.; Gavrilov, Jury A.; Kudinova, Olga I.; Maklakova, Tatyana A.; Akopian, Leonid A.; Mchedlov-Petrosian, Otar P.; Boilko, Mikhail I.; Staroselsky, Alexandr A.; and Tkachenko, Vladimir P., 4,330,573, Cl. 427-213.000.
Toa Medical Electronic Co., Ltd.: *See—*
Hayashi, Norihito, 4,330,745, Cl. 324-71.0CP.
Toagosei Chemical Industry Co., Ltd.: *See—*
Ogasawara, Takahisa; and Mizutani, Kiyokazu, 4,330,643, Cl. 525-445.000.
Toda, Kenichi, to Kabushiki Kaisha Polyurethan Engineering. Apparatus for measuring the amount of air bubbles contained in liquid. 4,329,869, Cl. 73-19.000.
Togari, Hisashi: *See—*
Fukaya, Hirokazu; and Togari, Hisashi, 4,330,757, Cl. 330-298.000.
Togawa Rubber Manufacturing Company, Limited: *See—*
Satoh, Seikoh; and Suzuki, Tadashi, 4,330,017, Cl. 138-126.000.
Togei, Ryoiku; and Hika, Yoshihiko, to Fujitsu Limited. Complementary semiconductor memory device. 4,330,849, Cl. 365-181.000.
Toia, Michael J. Coaxially fed dipole antenna. 4,330,783, Cl. 343-749.000.
Tokas, Edward F., to Monsanto Company. Foamable polymeric composition. 4,330,635, Cl. 521-79.000.
Token, Kenneth H., to United States of America, Navy. Circuit board electronic component cooling structure with composite spacer. 4,330,812, Cl. 361-386.000.
Toko, Inc.: *See—*
Miyajima, Hajime; and Nakakura, Akio, 4,330,767, Cl. 333-150.000.
Tokugawa, Fumitake: *See—*
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Tokyo Shibaura Denki Kabushiki Kaisha: *See—*
Araki, Tatsuo, 4,330,235, Cl. 416-96.00R.
Fujita, Masahiro, 4,330,867, Cl. 455-186.000.
Iwamoto, Akito; and Sekizawa, Hidekazu, 4,330,775, Cl. 340-146.30P.
Morinaga, Kaoru; and Kurafuzi, Takamasa, 4,330,801, Cl. 360-69.000.
Murakami, Teruo; Yamada, Kiyoshi; and Minami, Masana, 4,330,205, Cl. 356-237.000.
Okazaki, Shizuo, 4,329,858, Cl. 68-12.00R.
Yamaguchi, Hiroyasu; and Ishii, Takashi, 4,330,755, Cl. 330-271.000.
Yamazaki, Kazuo; Nomura, Katsumi; and Takemoto, Osafumi, 4,330,778, Cl. 340-642.000.
Tokyo Shibaura Electric Co., Ltd.: *See—*
Fukuda, Takeo; Hanawa, Kazuhiko; and Urui, Kiyoshi, 4,330,886, Cl. 370-62.000.
Tomita, Seisuke: *See—*
Tsukamoto, Takehiro; Takeshita, Michitaka; and Tomita, Seisuke, 4,330,592, Cl. 428-378.000.
Tomiyama, Ryoji: *See—*
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Tomiyama, Susumu: *See—*
Hayashi, Shozo; and Tomiyama, Susumu, 4,330,329, Cl. 420-511.000.
Tommasino, Luigi; and Zapparoli, Giorgio, to Comitato Nazionale per l'Energia Nucleare-CNEN. Apparatus and method for the dosimetry of neutrons. 4,330,710, Cl. 250-472.000.
Tomy Kogyo Co., Inc.: *See—*
Akiyama, Kenzo; and Tomiyama, Ryoji, 4,329,806, Cl. 46-44.000.
Topfer, Dieter: *See—*
Heist, Hans; and Topfer, Dieter, 4,329,936, Cl. 118-100.000.
Toriumi, Yasuo: *See—*
Miyamoto, Yoshimi; Toriumi, Yasuo; and Kojima, Keiichi, 4,330,493, Cl. 264-22.000.
Tork, Leo: *See—*
Heins, Ferdinand; Tork, Leo; and Hohne, Wolfgang, 4,330,597, Cl. 428-473.000.
Torterotot, Roland, to Pak Pro International N.V. Method for sterilizing a thermo-plastic strip used for the hot-forming of sterile containers and sterile packaging installation using the said method. 4,329,829, Cl. 53-426.000.
Tosa, Senji: *See—*
Yabuta, Kenji; Tosa, Senji; Oiri, Yasuhiko; and Tanaka, Chihaya, 4,330,785, Cl. 346-1.100.
Toshiba Kikai Kabushiki Kaisha: *See—*
Iida, Mitsuhiko, 4,329,923, Cl. 101-365.000.
Toshimitsu, Tohoru; Nagira, Norichika; and Ueda, Kenji, to Nippon Steel Corporation; and Nittetsu Plant Designing Corporation. Apparatus for cooling a steel strip in a continuous annealing line. 4,330,112, Cl. 266-115.000.
Towae, Friedrich: *See—*
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Towmotor Corporation: *See—*
Leskovec, Edward V., 4,330,007, Cl. 137-565.000.
Toyo Kogyo Co., Ltd.: *See—*
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Toyo Seikan Kaisha, Ltd.: *See—*
Kunimoto, Go; and Mori, Fumio, 4,330,353, Cl. 156-314.000.
Toyoda Koki Kabushiki Kaisha: *See—*
Eto, Kunihiko; Seki, Shiro; and Owa, Kaoru, 4,329,771, Cl. 29-568.000.
Toyota Jidosha Kogyo Kabushiki Kaisha: *See—*
Ueda, Tatehito; and Hiyama, Kunihiko, 4,329,965, Cl. 123-569.000.
Tranberg, Erik R.; and Widen, Bo G., to GKN Stenman AB. Method of manufacturing a lock follower arm with a press-fitted hub. 4,329,768, Cl. 29-417.000.
Treiber, Dieter; Kling, Adam; and Heider, Ulrich, to Siemens Aktiengesellschaft. Damping device for an electromagnetically driven printing hammer. 4,329,921, Cl. 101-93.020.
Trentelman, Jackson P.: *See—*
Pujari, Vimal K.; and Trentelman, Jackson P., 4,330,028, Cl. 165-1.000.
Triatik, Jerome J.: *See—*
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Triumph-Werke Nurnberg A.G.: *See—*
Deubner, Joachim; and Zeh, Franz, 4,330,354, Cl. 156-352.000.
Trombly, John E.: *See—*
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Trudel, Murray L.: *See—*
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Tsuda, Nobuaki: *See—*
Takenaka, Yoshinori; Tsuda, Nobuaki; and Kuroda, Toru, 4,330,410, Cl. 210-767.000.
Tsukamoto, Takehiro; Takeshita, Michitaka; and Tomita, Seisuke, to Bridgestone Tire Company Limited. Composite materials of steel cords and rubber and a method of producing the same. 4,330,592, Cl. 428-378.000.

Tsurumi, Shigeyuki: *See*—
Fujiwara, Koichi; Yamauchi, Goro; Arita, Kishio; and Tsurumi, Shigeyuki, 4,330,331, Cl. 148-2.000.
Tyco Industries, Inc.: *See*—
Branstner, Richard L., 4,329,886, Cl. 74-416.000.
Tyl, Miloslav: *See*—
Dykast, Jaroslav; Mikulecky, Karel; and Tyl, Miloslav, 4,329,839, Cl. 57-263.000.
Tyler, Derek E.; Cheskis, Harvey P.; Stone, Louis P.; and Pryor, Michael J., to Olin Corporation. Process and apparatus for making a metal alloy. 4,330,328, Cl. 75-76.000.
Tyler Refrigeration Corporation: *See*—
Abraham, Fayez F.; and Perez, Arthur, 4,329,852, Cl. 62-256.000.
Uda, Tsuyoshi: *See*—
Shidara, Keiichi; Goto, Naohiro; Kawamura, Tatsuro; Hiruma, Eikyu; Ikeda, Yohitsumu; Tanioka, Kenkichi; Hirai, Tadaaki; Takasaki, Yukio; Kusano, Chushirou; Uda, Tsuyoshi; and Nonaka, Yasuhiko, 4,330,733, Cl. 313-386.000.
Ueda, Ichiro: *See*—
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Ueda, Kenji: *See*—
Toshimitsu, Tohoru; Nagira, Norichika; and Ueda, Kenji, 4,330,112, Cl. 266-115.000.
Ueda, Tatehito; and Hiyama, Kunihiko, to Toyota Jidosha Kogyo Kabushiki Kaisha. Diesel engine exhaust gas recirculation and intake air flow control system. 4,329,965, Cl. 123-569.000.
Uhlrich, David C.: *See*—
Miller, Bradley W.; Hickenlooper, Franklin T.; Uhlrich, David C.; Godfrey, Marl D.; Clifford, Douglas M.; James, Rex L.; Watson, Robert E.; Keith, John C.; and Mortensen, Allen C., 4,330,839, Cl. 364-706.000.
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UNIC S.A.: *See*—
Salmon, Claude, 4,330,149, Cl. 296-190.000.
Union Carbide Corporation: *See*—
Jones, David N.; and Kurtz, Stuart J., 4,330,501, Cl. 264-566.000.
United Geophysical Corporation: *See*—
Peterson, Raymond A., 4,330,873, Cl. 367-60.000.
United Kingdom Atomic Energy Authority: *See*—
Cairns, James A.; Antill, John E.; and Noakes, Michael L., 4,330,436, Cl. 252-466.00J.
Kaye, Alan S.; and Millward, Peter, 4,330,762, Cl. 372-85.000.
United States Gypsum Company: *See*—
Wendt, Alan C., 4,329,820, Cl. 52-241.000.
United States of America
Agriculture: *See*—
Rankin, John C., 4,330,443, Cl. 527-312.000.
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Peterson, Phillip R.; Gavrielides, Athanasios; and Erkkila, John H., 4,330,211, Cl. 356-354.000.
Energy: *See*—
Dale, Steinar J.; and Cookson, Alan H., 4,330,682, Cl. 174-14.00R.
Hirayama, Chikara; and Wagner, George R., 4,330,347, Cl. 148-31.500.
Jackovitz, John F.; and Pantier, Earl A., 4,330,603, Cl. 429-206.000.
McDuff, George G., 4,330,777, Cl. 340-635.000.
Interior: *See*—
Henry, Helen G., 4,330,509, Cl. 423-85.000.
Montagna, Dominic; and Makar, Harry V., 4,330,090, Cl. 241-14.000.
National Aeronautics and Space Administration; administrator; with respect to an invention of:
Holt, Jack W.; Helman, Donald D.; and Smiser, Laurence W. Method for repair of thin glass coatings. 4,330,572, Cl. 427-140.000.
Shlichta, Paul J. Electromigration process for the purification of molten silicon during crystal growth. 4,330,359, Cl. 156-608.000.
National Aeronautics and Space Administration: *See*—
Elber, Wolf, 4,330,100, Cl. 244-48.000.
Navy: *See*—
Barnes, Ross O., 4,329,883, Cl. 73-864.520.
Christou, Aristos; and Davey, John E., 4,330,343, Cl. 148-1.500.
Esterowitz, Leon; and Kruer, Melvin R., 4,330,763, Cl. 372-41.000.
Farrow, Michael M., 4,330,699, Cl. 219-121.0LD.
Giuliani, John F.; and Auerbach, Abe, 4,330,570, Cl. 427-54.100.
Haynes, Harvey H.; and Rail, Robert D., 4,330,632, Cl. 501-140.000.
Hoffman, Clark R., 4,330,238, Cl. 417-19.000.
Huang, Peter H. C.; Weller, Joseph F.; and Giallorenzi, Thomas G., 4,330,768, Cl. 333-153.000.
Kang, George S.; Fransen, Lawrence J.; and Kline, Evans L., 4,330,689, Cl. 179-15.55R.
Mang, Guenter H., 4,329,938, Cl. 118-730.000.
Redfern, John T.; and Dressel, Gary A., 4,330,855, Cl. 370-100.000.
Ryno, Gaylon E.; and Hoffman, John G., 4,330,784, Cl. 343-771.000.
Shrout, Thomas R.; Schulze, Walter A.; and Biggers, James V., 4,330,593, Cl. 428-407.000.
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Gehm, Ulrich, 4,330,835, Cl. 364-560.000.
Goddijn, Bernardus H. A., 4,330,724, Cl. 310-49.00R.
Hinz, Hans D.; Rothgordt, Ulf; and Lobl, Herbert, 4,330,788, Cl. 346-157.000.
Manzke, Klaus D., 4,330,707, Cl. 250-311.000.
Schemmann, Hugo; and Diefenbach, Gerhard, 4,329,781, Cl. 30-34.200.
Van Assche, Paul J., 4,330,596, Cl. 428-428.000.
Van Dijk, Ate, 4,330,880, Cl. 369-32.000.
United Technologies Corporation: *See*—
Coleman, Allen K., 4,330,717, Cl. 307-46.000.
Fischer, William C.; and Adams, Don L., 4,330,829, Cl. 364-434.000.
University of California, The Regents of the: *See*—
Lynn, Scott, 4,330,478, Cl. 260-439.00R.
University of Illinois Foundation: *See*—
Gaul, John H., Jr.; and Drago, Russell S., 4,330,642, Cl. 525-337.000.
University of Iowa Foundation: *See*—
Burton, Donald J.; and Flynn, Richard M., 4,330,486, Cl. 260-502.40P.
Urban, Dieter: *See*—
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Urui, Kiyoshi: *See*—
Fukuda, Takeo; Hanawa, Kazuhiko; and Urui, Kiyoshi, 4,330,886, Cl. 370-62.000.
Ushio Air Tool Co., Ltd.: *See*—
Kakimoto, Masakazu, 4,330,159, Cl. 308-9.000.
Utner, Ferdinand; and Vetter, Harald, to Siemens Aktiengesellschaft. Bridge circuit formed of two or more resistance strain gauges. 4,329,878, Cl. 73-766.000.
Utsumi, Hiroshi: *See*—
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Valeron Corporation, The: *See*—
Gibbs, Norman R., 4,330,333, Cl. 75-244.000.
Van Dresser Corporation: *See*—
Doerer, Richard P., 4,330,584, Cl. 428-91.000.
Van Assche, Paul J., to U.S. Philips Corporation. Bodies composed of at least two parts, sealing glass and method for bonding parts. 4,330,596, Cl. 428-428.000.
Van Beek, John H.: *See*—
Rozeboom, Antonie G.; and Van Beek, John H., 4,330,091, Cl. 241-73.000.
Van Cauter, Albert; and Terneu, Robert, to BFG Glassgroup. Process for coating glass. 4,330,318, Cl. 65-60.00C.
Vandenbossche, Jean-Jacques M.: *See*—
Bugaut, Andree; Vandenbossche, Jean-Jacques M.; Shahin, Majdi M.; and Kalopissis, Gregoire, 4,330,292, Cl. 8-411.000.
van der Voort, Henricus G. P., to Shell Oil Company. Process for the preparation of alkylene polyamine derivatives of polyalkenyl-substituted succinic anhydride. 4,330,471, Cl. 548-546.000.
Vandevier, Joseph E.: *See*—
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VanDewoestine, Robert V.: *See*—
Allaire, Roger A.; Pardue, William F., Jr.; and VanDewoestine, Robert V., 4,330,503, Cl. 422-177.000.
Van Dijk, Ate, to U.S. Philips Corporation. Apparatus for optically reading a disc-shaped record carrier, in particular for rapidly locating a desired program section. 4,330,880, Cl. 369-32.000.
Van Leeuwen, Petrus W. N. M.; and Roobeek, Cornelis F., to Shell Oil Company. Process for the hydroformylation of olefins. 4,330,678, Cl. 568-454.000.
Van Loveren, Augustinus G.: *See*—
Boden, Richard M.; Dekker, Lambert; Schmitt, Frederick L.; and Van Loveren, Augustinus G., 4,330,415, Cl. 252-8.600.
Boden, Richard M.; Dekker, Lambert; Schmitt, Frederick L.; and Van Loveren, Augustinus G., 4,330,425, Cl. 252-187.00H.
van Mil, Martinus P. G., to Stork PMT BV. Fowl defeathering apparatus. 4,329,760, Cl. 17-11.10R.
Vann, Roy R.; Ribble, George W.; and George, Flint R., to Geo Vann, Inc. Pressure actuated vent assembly for slanted wellbores. 4,330,039, Cl. 166-297.000.
Varrasso, Eugene C., to Owens-Corning Fiberglas Corporation. Apparatus for controlling the proportion of liquid and dry particulate matter added to a pelletizer. 4,330,246, Cl. 425-140.000.
Vayssie, Charles: *See*—
Bouillon, Claude; Vayssie, Charles; and Richard, Francoise, 4,330,488, Cl. 260-511.000.
VEB Kombinat Fortschritt Landmaschinen Neustadt in Sachsen: *See*—
Pietschmann, Frank; John, Gunter; Eistert, Theodor; Noack, Christian; Oliva, Klaus; Zumpe, Bernd; Spaida, Hans P.; Boltizar, Pal; Fabry, Istvan; Vida, Csongor; Lakos, Lajos; and Klement, Matjas, 4,329,832, Cl. 56-98.000.

VEB Polygraph Leipzig, Kombinat fur Polygraphische Maschinen und Ausruestungen: *See—*
Weisbach, Gunter, 4,330,117, Cl. 271-235.000.
Verbaan, Bernard, to National Institute for Metallurgy. Leaching of zinc containing sulphide minerals. 4,330,379, Cl. 204-119.000.
Vereinigte Metallwerke Ranshofen-Berndorf Aktiengesellschaft: *See—*
Worz, Helmut; Leuprecht, Hermann; and Biechl, Jakob, 4,330,375, Cl. 204-35.00R.
Vertova, Ermanno. Method and machine for making vials from glass tubing. 4,330,317, Cl. 65-29.000.
Vesley, George F., to Minnesota Mining and Manufacturing Company. Photoactive mixture of acrylic monomers and chromophore-substituted halomethyl-2-triazine. 4,330,590, Cl. 428-336.000.
Vetter, Harald: *See—*
Utner, Ferdinand; and Vetter, Harald, 4,329,878, Cl. 73-766.000.
Vettorello, Emilio. Tamburello. 4,330,124, Cl. 273-67.00B.
Vicom Systems, Inc.: *See—*
Pratt, William K.; Abramatic, Jean-Francois; and Faugeras, Olivier, 4,330,833, Cl. 364-515.000.
Victor Company of Japan, Ltd.: *See—*
Iwabuchi, Yoshitaka; and Nozaki, Masao, 4,330,806, Cl. 360-106.000.
Ohara, Terumi; Mizuno, Yoshio; Iwabuchi, Yoshitaka; and Oketani, Kenzi, 4,330,791, Cl. 358-8.000.
Yokokawa, Sumio; Takanashi, Itsuo; Miyoshi, Tadayoshi; Nakagaki, Shintaro; Motoyama, Koichiro; and Miyazaki, Kenichi, 4,330,797, Cl. 358-224.000.
Vida, Csongor: *See—*
Pietschmann, Frank; John, Gunter; Eistert, Theodor; Noack, Christian; Oliva, Klaus; Zumpe, Bernd; Spaida, Hans P.; Boltizar, Pal; Fabry, Istvan; Vida, Csongor; Lakos, Lajos; and Klement, Matjas, 4,329,832, Cl. 56-98.000.
Villari, Frank K.: *See—*
Schaar, Charles H.; Marra, Nicholas A.; Dunn, William J.; and Villari, Frank K., 4,330,220, Cl. 401-134.000.
Vincentini, Franco: *See—*
Giustiniani, Piercarlo; and Vincentini, Franco, 4,330,781, Cl. 343-5.0DP.
Vinuesa, Germain: *See—*
Lebas, Jean-Marie; Rat, Pierre; Dupont, Jean-Marcel; and Vinuesa, Germain, 4,330,251, Cl. 425-405.00H.
Vissers, Hermanus H.; and Winkel, Jan, to Expert N.V. Agricultural implement for working crop lying on the field. 4,329,837, Cl. 56-370.000.
Vivitar Corporation: *See—*
Orban, Jean M., 4,330,737, Cl. 315-241.00P.
Voetz, Franz J.: *See—*
May, Adolf; and Voetz, Franz J., 4,330,341, Cl. 106-308.00N.
Volkamer, Klaus: *See—*
Kuessner, Klaus; Irnich, Rudolf; Scharpenberg, Hans-Georg; and Volkamer, Klaus, 4,330,305, Cl. 55-48.000.
von Tell AB: *See—*
Jonasson, Bo E., 4,329,935, Cl. 114-72.000.
von und zu Aufsess, Friedrich F.; Huxhorn, Gunter; Pohl, Hans; and Sasse, Wolfgang, to Internationale Octrooi Maatschappij "Octropa" B.V. Process and apparatus for the simultaneous biaxial stretching of a plastic film. 4,330,499, Cl. 264-289.600.
Vulcan Materials Company: *See—*
Franks, John A., Jr., 4,330,377, Cl. 204-93.000.
Vyas, Rajal M.: *See—*
Hannon, Martin J.; Vyas, Rajal M.; and Schwarz, Rudolph R., 4,330,672, Cl. 528-493.000.
Vysoka skola chemicko-technologicka: *See—*
Boehm, Valter; Maroszcyk, Veslav; Cieslar, Antonin; Bartuska, Miloslav; Rybak, Karel; Zverina, Karel; and Zelezny, Eduard, 4,330,568, Cl. 427-34.000.
Vyzkumny ustav bavlnarsky: *See—*
Dykast, Jaroslav; Mikulecky, Karel; and Tyl, Miloslav, 4,329,839, Cl. 57-263.000.
W. H. Willert, Inc.: *See—*
Willert, William H., 4,330,214, Cl. 366-78.000.
W. Haking Enterprises Limited: *See—*
Chan, Kwok Yan, 4,330,190, Cl. 354-275.000.
W. R. Grace & Co.: *See—*
O'Rell, Dennis D.; Hien, Nguyen V.; Lundquist, Joseph T., Jr.; and Lundsager, Christian B., 4,330,602, Cl. 429-206.000.
Wacker-Chemitronic Gesellschaft fur Elektronic-Grundstoffe mbH: *See—*
Kuhn-Kuhnenfeld, Franz; Kohl, Franz; Nemetz, Friedrich; and Zechmeister, Gerhard, 4,330,361, Cl. 156-617.0SP.
Wacker-Chemitronic Gesellschaft fur Elektronik-Grundstoffe mbH: *See—*
Zulehner, Werner, 4,330,362, Cl. 156-617.0SP.
Wada, Ryoichi; Mitsuharu, Tsuchiya; and Takanori, Seno, to Matsushita Electric Industrial Co., Ltd. Error correcting device. 4,330,860, Cl. 371-37.000.
Wagensonner, Eduard: *See—*
Stemme, Otto; Wagensonner, Eduard; and Ruf, Wolfgang, 4,330,793, Cl. 358-56.000.
Wagner, George R.: *See—*
Hirayama, Chikara; and Wagner, George R., 4,330,347, Cl. 148-31.500.
Wagner, Richard C., to Hollymatic Corporation. Molding apparatus with sheet applicator. 4,329,828, Cl. 53-122.000.
Wald, Roland, to Sandoz Ltd. Anthraquinone compounds and process for dyeing therewith. 4,330,294, Cl. 8-643.000.
Walker, Gary B. Scanner drive clutch. 4,330,201, Cl. 355-50.000.
Walker, Michael L.: *See—*
Hall, Bobby E.; and Walker, Michael L., 4,330,419, Cl. 252-8.55B.
Wallace, John F., to Steel Founder's Society of America. Method for in-mold deoxidation of steel. 4,330,024, Cl. 164-56.100.
Wallis, Albrecht H.: *See—*
Hertel, Otto; Beyer, Karl-Heinz; Wallis, Albrecht H.; Wulz, Klaus; and Izi, Kamuran, 4,330,480, Cl. 260-458.00R.
Walters, D. F., to Dresser Industries, Inc. Rotary rock bit with improved thrust flange. 4,330,158, Cl. 308-8.200.
Wardle, Edmund: *See—*
Ball, Frank C.; and Wardle, Edmund, 4,329,872, Cl. 73-49.500.
Warehime, Norwood R. Multi-tethered ball assemblages and their uses. 4,330,131, Cl. 273-413.000.
Warkentin, Aaron J.; and Hiebert, Jacob, to Pennwalt Corporation. Apparatus for packing articles of fruit into boxes. 4,329,831, Cl. 53-537.000.
Warner Electric Brake & Clutch Company: *See—*
MacDonald, J. G. Fraser, 4,330,054, Cl. 192-35.000.
Warner-Lambert Company: *See—*
Dodd, Charles G., 4,330,576, Cl. 427-255.100.
Watanabe, Haruo: *See—*
Kawasumi, Kouichi; Watanabe, Haruo; and Seto, Junetsu, 4,330,600, Cl. 428-694.000.
Watanabe, Hiroshi; Mikata, Tsuruo; and Gohda, Kenichi, to Kao Soap Co., Ltd. Shampoo composition. 4,330,526, Cl. 424-70.000.
Watanabe, Masazumi: *See—*
Sugihara, Hirosada; Watanabe, Masazumi; Kawada, Mitsuru; and Imada, Isuke, 4,330,554, Cl. 424-285.000.
Watanabe, Seizo: *See—*
Kato, Toshikazu; Saitou, Sinichi; Watanabe, Seizo; Nishiyama, Toyoo; Shimdda, Misao; Shibata, Tutomu; Kimura, Kenji; and Satoh, Ken, 4,330,802, Cl. 360-96.600.
Watanabe, Shin-ichi: *See—*
Yamamura, Masaaki; Moriyama, Noboru; and Watanabe, Shin-ichi, 4,330,301, Cl. 44-51.000.
Watson, Robert E.: *See—*
Miller, Bradley W.; Hickenlooper, Franklin T.; Uhlrich, David C.; Godfrey, Marl D.; Clifford, Douglas M.; James, Rex L.; Watson, Robert E.; Keith, John C.; and Mortensen, Allen C., 4,330,839, Cl. 364-706.000.
Wavin B.V.: *See—*
Grendelman, Mannes, 4,330,016, Cl. 138-109.000.
Wean United, Inc.: *See—*
Ledebur, Harry C., 4,329,864, Cl. 72-239.000.
Weaver, Richard L. Flow control apparatus for silage unloader. 4,330,233, Cl. 414-310.000.
Webb, Michael G., to British Petroleum Company Limited, The. Antipollution barrier. 4,330,223, Cl. 405-63.000.
Webber, Robert C.: *See—*
Stovall, Philip H.; and Webber, Robert C., 4,330,571, Cl. 427-120.000.
Weber, David E.: *See—*
Rose, Edward; and Weber, David E., 4,329,920, Cl. 99-450.400.
Weiden, Horst: *See—*
Becker, Gunter; and Weiden, Horst, 4,330,276, Cl. 433-69.000.
Weil, Peter. Device for cleaning sensitive surfaces of solid bodies. 4,329,753, Cl. 15-104.00A.
Weinert, Lawrence E., to Crown Zellerbach Corporation. Broken package culling system. 4,330,064, Cl. 209-617.000.
Weinhardt, Robert A.: *See—*
Long, Robert T.; and Weinhardt, Robert A., 4,329,821, Cl. 52-309.120.
Weinschel Engineering Co., Inc.: *See—*
Patukonis, Robert J., 4,330,765, Cl. 333-81.00A.
Weir, Donald R.; Kerfoot, Derek G. E.; and Scheie, Hugh C., to Sherritt Gordon Mines Limited. Removal of selenium (IV) and (VI) from acidic copper sulphate solutions. 4,330,508, Cl. 423-42.000.
Weisbach, Gunter, to VEB Polygraph Leipzig, Kombinat fur Polygraphische Maschinen und Ausruestungen. Method and device for aligning sheets to be printed in a press. 4,330,117, Cl. 271-235.000.
Weiss, Andrew B.: *See—*
Alexander, Harold; Parsons, John R.; Strauchler, Irving D.; and Weiss, Andrew B., 4,329,743, Cl. 3-1.000.
Welch, M. Bruce, to Phillips Petroleum Company. Catalyst and process of polymerization of alpha-monoolefins. 4,330,648, Cl. 526-125.000.
Weller, Joseph F.: *See—*
Huang, Peter H. C.; Weller, Joseph F.; and Giallorenzi, Thomas G., 4,330,768, Cl. 333-153.000.
Welsh, Richard E.: *See—*
Dougherty, Emery W.; and Welsh, Richard E., 4,330,280, Cl. 433-90.000.
Welzel, Josef; Bull, Hans; and Maykemper, Alfred, to Herman Hemscheidt Maschinenfabrik GmbH & Co. Roof-support distancing apparatus. 4,330,226, Cl. 405-291.000.
Wendt, Alan C., to United States Gypsum Company. Mounting strip with carpet gripping means for relocatable partition walls. 4,329,820, Cl. 52-241.000.
Wernicke, Friedrich C.: *See—*
Heimeier, Helmut H.; Klein, Wielfried; Klink, Erich; and Wernicke, Friedrich C., 4,330,853, Cl. 365-227.000.
Wescott, Ronald O.: *See—*
Pittman, Robert B.; Wescott, Ronald O.; and Offerman, Michael, 4,330,164, Cl. 339-49.00R.
Western Electric Company, Inc.: *See—*
Chapman, Ivan B., Jr., 4,330,093, Cl. 242-7.170.

Wong, Ching-Ping, 4,330,637, Cl. 524-720.000.
Westinghouse Electric Corp.: *See—*
Brecher, Lee E.; and Wu, Christopher K., 4,330,523, Cl. 423-579.000.
Glatthorn, Raymond H., 4,329,769, Cl. 29-568.000.
Herrold, Lear C., 4,330,270, Cl. 432-259.000.
Kemeny, George A.; and Gorman, Joseph G., 4,329,971, Cl. 124-3.000.
Lawson, Charles A., II, 4,330,843, Cl. 364-900.000.
LeBreton, Albert F., 4,330,236, Cl. 416-198.00A.
Perry, Robert H., 4,330,830, Cl. 364-436.000.
Westvaco Corporation: *See—*
Alford, John A., 4,330,398, Cl. 209-166.000.
Whirlpool Corporation: *See—*
Tate, Ralph, Jr.; Woods, John T.; and Schapker, Joseph G., 4,330,310, Cl. 62-275.000.
White, Dwain M.; and Keyes, David G., to General Electric Company. Method for making polyetherimides. 4,330,666, Cl. 528-207.000.
White, Lionel S., Jr., to Texas Instruments Incorporated. Dynamic decoder input for semiconductor memory. 4,330,851, Cl. 365-202.000.
White, Lionel S., Jr.: *See—*
Redwine, Donald J.; White, Lionel S., Jr.; and Rao, G. R. Mohan, 4,330,852, Cl. 365-221.000.
White, William R.; and Reale, John, Jr., to Texaco Inc. Low ash, low phosphorus motor oil formulations. 4,330,420, Cl. 252-32.70E.
Whiteside, Arliss E.; and Freedman, Morris D., to Bendix Corporation, The. Synchronizer and synchronization system for a multiple computer system. 4,330,826, Cl. 364-200.000.
Whitham, James G.: *See—*
Bexton, Stewart G.; Hildred, Gordon C.; Higgins, John T.; and Whitham, James G., 4,330,319, Cl. 71-28.000.
Whitley, David A.: *See—*
Richardson, Paul; and Whitley, David A., 4,330,155, Cl. 299-11.000.
Wich, Thomas J., to General Motors Corporation. Diesel fuel pump hydraulic governor control mechanism. 4,329,958, Cl. 123-387.000.
Widen, Bo G.: *See—*
Tranberg, Erik R.; and Widen, Bo G., 4,329,768, Cl. 29-417.000.
Wiechert, Rudolf: *See—*
Annen, Klaus; Laurent, Henry; Hofmeister, Helmut; Petzoldt, Karl; and Wiechert, Rudolf, 4,330,541, Cl. 424-243.000.
Wiese, Peter: *See—*
Jagieniak, Peter; Koerdt, Hans; Bohme, Jochen; Odrich, Dieter; Pochert, Rudolf; and Wiese, Peter, 4,330,700, Cl. 219-121.0PP.
Wilding, Frank J.: *See—*
Aikens, Paul W.; and Wilding, Frank J., 4,330,163, Cl. 339-17.0CF.
Wilensky, Barry F.; and Maggi, Joseph A., to Bendix Corporation, The. Display analyzer having angular degrees of freedom. 4,330,779, Cl. 340-705.000.
Wiles, Michael F.: *See—*
Daniels, R. Gary; Bennett, Thomas H.; and Wiles, Michael F., 4,330,842, Cl. 364-900.000.
Wilhelms, Otto-Henning: *See—*
Friebe, Walter-Gunar; Winter, Werner; Thiel, Max; Roesch, Androniki; and Wilhelms, Otto-Henning, 4,330,549, Cl. 424-267.000.
Willert, William H., to W. H. Willert, Inc. Plasticizing screw. 4,330,214, Cl. 366-78.000.
Willi, Hanspeter: *See—*
Michl, Rudy; and Willi, Hanspeter, 4,330,283, Cl. 433-201.000.
Williams, George F.: *See—*
Olsen, Everett O.; Estes, Robert F.; Rezendes, Paul W.; and Williams, George F., 4,329,910, Cl. 91-375.00R.
Williams, Malcolm: *See—*
Woodhouse, Richard G.; and Williams, Malcolm, 4,329,960, Cl. 123-436.000.
Wilson, Donald C., to FMC Corporation. Method and apparatus for dewatering slurries of coal and the like. 4,330,413, Cl. 210-806.000.
Wilson, Philip H. Archery bow and arrow stabilizer. 4,329,972, Cl. 124-24.00R.
Wilson, Ray. Cylinder maintenance tool. 4,329,754, Cl. 15-104.01R.
Wilson Sales Company, Inc.: *See—*
Miller, Charles G.; and Stephens, James B., 4,330,177, Cl. 350-311.000.
Wilson, Wilfred W., to Sloan, Frank. Air mixing apparatus. 4,330,082, Cl. 236-13.000.
Winand, Louis, to Rhone-Poulenc Industries. Decolorization and purification of crude wet-process phosphoric acid. 4,330,516, Cl. 423-321.00S.
Wine, Charles M., to RCA Corporation. Adaptive stylus kicker using disc track and disc sector information. 4,330,879, Cl. 369-32.000.
Winkel, Jan: *See—*
Vissers, Hermanus H.; and Winkel, Jan, 4,329,837, Cl. 56-370.000.
Winter, Joseph; Brenneman, William; and Fister, Julius C., to Olin Corporation. Composite material. 4,330,599, Cl. 428-675.000.
Winter, Joseph: *See—*
Pryor, Michael J.; and Winter, Joseph, 4,329,863, Cl. 72-205.000.
Winter, Werner: *See—*
Friebe, Walter-Gunar; Winter, Werner; Thiel, Max; Roesch, Androniki; and Wilhelms, Otto-Henning, 4,330,549, Cl. 424-267.000.
Wisconsin Alumni Research Foundation: *See—*
Davies, Julian E.; and Harford, Stephen, 4,330,621, Cl. 435-15.000.
Taylor, James W.; and Romero, Romer A., 4,330,295, Cl. 23-230.00M.
Witzel, Homer D. Self-propelled harvesting combine. 4,329,833, Cl. 56-228.000.
Wolfe, Joel Z.: *See—*
Nelson, Theodore W., Jr.; Corkle, David B.; Wolfe, Joel Z.; and Ganzel, Larry A., 4,330,511, Cl. 423-210.000.
Wolfers, Heinrich; Mayer, Wolfram; Rudolph, Hans; and Mietzsch, Fritz, to Bayer Aktiengesellschaft. Radical polymerization in the presence of substituted tartaric acid or tartaric acid derivatives as initiators. 4,330,638, Cl. 525-12.000.
Wolff Walsrode Aktiengesellschaft: *See—*
Bohmer, Branislaw; Hoppe, Lutz; Szablikowski, Klaus; Kudora, Dieter; and Behn, Rudolf, 4,330,441, Cl. 525-54.230.
Wollschlegel, Peter: *See—*
Lang, Helmut; and Wollschlegel, Peter, 4,330,034, Cl. 165-113.000.
Wong, Ching-Ping, to Western Electric Company, Inc. Encapsulated electronic devices and encapsulating compositions. 4,330,637, Cl. 524-720.000.
Wong, George H., to Beloit Corporation. Device and method for handling trim strip in a web slitter. 4,329,893, Cl. 83-24.000.
Wood, Prentice J., to Mead Corporation, The. Interlocking structure for a pair of overlapping panels. 4,330,079, Cl. 229-40.000.
Wood, Robert L.: *See—*
Moyer, William A.; and Wood, Robert L., 4,330,614, Cl. 430-325.000.
Wood, Russell K., to American Standard Inc. Kiln car. 4,330,267, Cl. 432-241.000.
Wood, William A.; and D'Amore, Frank J., to Rain Bird Sprinkler Manufacturing Corporation. Impulse sprinkler deflector spoon. 4,330,087, Cl. 239-233.000.
Woodbrey, James C., to Monsanto Company. Metal-thermoplastic-metal laminates. 4,330,587, Cl. 428-215.000.
Woodhouse, Richard G.; and Williams, Malcolm, to Lucas Industries Limited. Fuel control system for an internal combustion engine. 4,329,960, Cl. 123-436.000.
Woods, John T.: *See—*
Tate, Ralph, Jr.; Woods, John T.; and Schapker, Joseph G., 4,330,310, Cl. 62-275.000.
Woolington, John C.: *See—*
Rich, Hubert A.; Saffer, Gary M.; and Woolington, John C., 4,329,808, Cl. 46-81.000.
Wormser, Eric M.; and Mezoff, Carl R. Solar energy devices. 4,329,978, Cl. 126-417.000.
Worthington, David K.: *See—*
Foulkes, John D.; Worthington, David K.; and Trombly, John E., 4,330,687, Cl. 179-2.0DP.
Wortman, Alex: *See—*
Sheinberg, Zena; and Wortman, Alex, 4,330,122, Cl. 273-51.000.
Worz, Helmut; Leuprecht, Hermann; and Biechl, Jakob, to Vereinigte Metallwerke Ranshofen-Berndorf Aktiengesellschaft. Method of cleaning cathodes. 4,330,375, Cl. 204-35.00R.
Wreede, John E.; Graube, Andrejs; and Mulvihill, Mark A., to Hughes Aircraft Company. Fabrication of holograms on plastic substrates. 4,330,604, Cl. 430-2.000.
Wright, Charles H.: *See—*
Anderson, Raymond P.; Schmalzer, David K.; and Wright, Charles H., 4,330,388, Cl. 208-8.0LE.
Wright, Simon C. M. Demodulator arrangement. 4,330,863, Cl. 375-81.000.
Wristers, Harry J., deceased (by Wristers, Joy K., executrix), to Exxon Research & Engineering Co. Titanium trihalide catalyst and process for its production. 4,330,433, Cl. 252-429.00B.
Wristers, Joy K., executrix: *See—*
Wristers, Harry J., deceased, 4,330,433, Cl. 252-429.00B.
Wu, Christopher K.: *See—*
Brecher, Lee E.; and Wu, Christopher K., 4,330,523, Cl. 423-579.000.
Wulz, Klaus: *See—*
Hertel, Otto; Beyer, Karl-Heinz; Wallis, Albrecht H.; Wulz, Klaus; and Izi, Kamuran, 4,330,480, Cl. 260-458.00R.
Wurttembergische Metallwarenfabrik: *See—*
Bauer, Edwald, 4,330,069, Cl. 220-203.000.
Xerox Corporation: *See—*
Biegesen, David K.; Johnson, Noble M.; Bartlelink, Dirk J.; and Moyer, Marvin D., 4,330,363, Cl. 156-620.000.
Hewitt, Harvey J., 4,330,610, Cl. 430-126.000.
Hoffend, Thomas R.; and Nelson, Robert A., 4,330,460, Cl. 524-849.000.
Lavallee, Pierre A., 4,330,195, Cl. 355-3.00R.
Limburg, William W.; and Pai, Damodar M., 4,330,608, Cl. 430-59.000.
Neyhart, James H.; Brown, George A.; Relyea, Lloyd A.; Scharfe, Merlin E.; and Pinsler, Heinz W., 4,330,609, Cl. 430-126.000.
Smith, Richard E.; and Yonovich, John R., 4,330,197, Cl. 355-14.0SH.
Stange, Klaus K., 4,330,193, Cl. 355-3.0DD.
Swift, Joseph A.; Ray, C. Michael; and Ewing, Joan R., 4,330,349, Cl. 156-72.000.
Yabuta, Kenji; Tosa, Senji; Oiri, Yasuhiko; and Tanaka, Chihaya, to Mitsubishi Paper Mills, Ltd.; and Nippon Hoso Kyokai. Thermal recording method. 4,330,785, Cl. 346-1.100.
Yamada, Hazime; and Ishida, Akira, to Nippon Telegraph & Telephone Public Corp. Logic circuit with asymmetrical quantum interferometric circuits. 4,330,841, Cl. 364-784.000.
Yamada, Kiyoshi: *See—*
Murakami, Teruo; Yamada, Kiyoshi; and Minami, Masana, 4,330,205, Cl. 356-237.000.

Yamaguchi, Hiroyasu; and Ishii, Takashi, to Tokyo Shibaura Denki Kabushiki Kaisha. Power-amplifying circuit. 4,330,755, Cl. 330-271.000.

Yamaguchi, Isao, to Matsushita Electric Industrial Co., Ltd. Electrophotographic copying apparatus. 4,330,196, Cl. 355-8.000.

Yamaguchi, Osamu: *See*—
Nishimatsu, Mineaki; Mukai, Sadayoshi; Hayashi, Yoshinori; Yamaguchi, Osamu; Ito, Akira; and Ahiko, Nobuo, 4,330,439, Cl. 252-570.000.

Yamaji, Teizo: *See*—
Yoshisato, Eishin; Azuma, Shizuo; and Yamaji, Teizo, 4,330,633, Cl. 501-152.000.

Yamamoto Kagaku Gosei Kabushiki Kaisha: *See*—
Hatano, Yoshihiro; and Yamamoto, Kenji, 4,330,473, Cl. 549-226.000.

Yamamoto, Kenji: *See*—
Hatano, Yoshihiro; and Yamamoto, Kenji, 4,330,473, Cl. 549-226.000.

Yamamoto, Masaru: *See*—
Fujikawa, Tetsuzo; Seto, Yasuhiro; Yamamoto, Masaru; and Tanaka, Ichiro, 4,329,948, Cl. 123-73.0AA.

Yamamura, Masaaki; Moriyama, Noboru; and Watanabe, Shin-ichi, to Kao Soap Co., Ltd. Dispersant for aqueous slurry of coal powder. 4,330,301, Cl. 44-51.000.

Yamamura, Yuichi: *See*—
Suzuki, Tomokazu; Hayashi, Akira; and Yamamura, Yuichi, 4,330,558, Cl. 424-319.000.

Yamaoka, Noboru: *See*—
Matsuura, Kazuo; Yamaoka, Noboru; Yanahashi, Shinichi; and Miyoshi, Mituji, 4,330,639, Cl. 525-240.000.

Yamashita, Tadaoki: *See*—
Ohta, Takeo; Akahira, Nobuo; Nakamura, Tatsushi; and Yamashita, Tadaoki, 4,330,883, Cl. 369-100.000.

Yamauchi, Goro: *See*—
Fujiwara, Koichi; Yamauchi, Goro; Arita, Kishio; and Tsurumi, Shigeyuki, 4,330,331, Cl. 148-2.000.

Yamazaki, Kazuo; Nomura, Katsumi; and Takemoto, Osafumi, to Tokyo Shibaura Denki Kabushiki Kaisha. Device for detecting broken filaments in lampe. 4,330,778, Cl. 340-642.000.

Yanahashi, Shinichi: *See*—
Matsuura, Kazuo; Yamaoka, Noboru; Yanahashi, Shinichi; and Miyoshi, Mituji, 4,330,639, Cl. 525-240.000.

Yanaihara, Noboru; and Sugiura, Nobuo, to Amano Pharmaceutical Co., Ltd. Process for the production of cholecystokinin-pancreozymin C-terminal peptide amide sulfate esters. 4,330,466, Cl. 260-112.50R.

Yano, Kiyotosi; Ishikawa, Eizi; and Yoshiyama, Shigeru, to Nippondenso Co., Ltd. Electromagnetic valve. 4,330,004, Cl. 137-343.000.

Yardley, James T.; Rosan, Alan M.; and Menger-Hammond, Eva L., to Allied Corporation. Synthesis process using photo-induced deligandation. 4,330,382, Cl. 204-157.10R.

Yasuda, Hiroshi: *See*—
Obata, Shuichi; Yasuda, Hiroshi; and Fukushima, Yukihiro, 4,330,884, Cl. 369-255.000.

Yata, Isao: *See*—
Matsuoka, Kyoichiro; Irie, Nobuyasu; Inoue, Satoshi; Ito, Katsuto; and Yata, Isao, 4,330,111, Cl. 266-106.000.

Yelland, Michael: *See*—
Brierley, David; Ridyard, Denis R. A.; and Yelland, Michael, 4,330,468, Cl. 260-198.000.

Yih, Roy Y.: *See*—
Bayer, Horst O.; Swithenbank, Colin; and Yih, Roy Y., 4,330,324, Cl. 71-105.000.

Yokokawa, Sumio; Takanashi, Itsuo; Miyoshi, Tadayoshi; Nakagaki, Shintaro; Motoyama, Koichiro; and Miyazaki, Kenichi, to Victor Company of Japan, Ltd. View-finder for television camera. 4,330,797, Cl. 358-224.000.

Yokota, Hideo, to Canon Kabushiki Kaisha. Range detecting device. 4,330,202, Cl. 356-1.000.

Yoneda, Haruyuki: *See*—
Sakurai, Hisaya; Morita, Hideo; Miya, Masayoshi; Takaya, Katsuhiko; and Yoneda, Haruyuki, 4,330,650, Cl. 526-127.000.

Yoneda, Kenji; Nakazato, Masao; Yuminaka, Takeo; Sakata, Kazuhiro; and Kuzunuki, Soshiro, to Hitachi, Ltd. Elevator test operation apparatus. 4,330,838, Cl. 364-580.000.

Yong, Raymond N.; and Sethi, Amar J., to Suncor Inc. Destabilization of sludge with hydrolyzed starch flocculants. 4,330,409, Cl. 210-731.000.

Yonovich, John R.: *See*—
Smith, Richard E.; and Yonovich, John R., 4,330,197, Cl. 355-14.0SH.

Yoshida, Hajime, to Hajime Industries Ltd. Inspection apparatus for defects on patterns. 4,330,712, Cl. 250-572.000.

Yoshida Kogyo K.K.: *See*—
Doori, Hisashi, 4,329,778, Cl. 29-768.000.

Yoshida, Takeo: *See*—
Miyamoto, Satoru; and Yoshida, Takeo, 4,330,734, Cl. 313-390.000.

Yoshine, Hiroki: *See*—
Takasaki, Yoshitaka; and Yoshine, Hiroki, 4,330,856, Cl. 370-102.000.

Yoshino Kogyosho Co., Ltd.: *See*—
Ota, Akiho; and Hayashi, Yoshiaki, 4,330,579, Cl. 428-35.000.
Suzuki, Sadao, 4,330,255, Cl. 425-529.000.

Yoshino, Nobuo: *See*—
Sogo, Hiroshi; and Yoshino, Nobuo, 4,330,099, Cl. 244-3.130.

Yoshisato, Eishin; Azuma, Shizuo; and Yamaji, Teizo, to Teijin Limited. Solid electrolyte. 4,330,633, Cl. 501-152.000.

Yoshiyama, Shigeru: *See*—
Yano, Kiyotosi; Ishikawa, Eizi; and Yoshiyama, Shigeru, 4,330,004, Cl. 137-343.000.

Young, Fred M., to Young Radiator Company. Method of soldering radiator tanks. 4,330,077, Cl. 228-139.000.

Young Radiator Company: *See*—
Young, Fred M., 4,330,077, Cl. 228-139.000.

Yuminaka, Takeo: *See*—
Yoneda, Kenji; Nakazato, Masao; Yuminaka, Takeo; Sakata, Kazuhiro; and Kuzunuki, Soshiro, 4,330,838, Cl. 364-580.000.

Zahnradfabrik Friedrichshafen, AG.: *See*—
de Maight, Winfried; and Schutze, Ronald, 4,329,912, Cl. 91-420.000.

Zaitsev, Anatoly V.: *See*—
Kuznetsov, Lev B.; Strelkov, Valentin V.; Zaitsev, Anatoly V.; Lvov, Igor A.; and Romanova, Valentina P., 4,329,868, Cl. 73-19.000.

Zambelli, Adolfo: *See*—
Beach, David L.; Lunden, Richard W.; and Zambelli, Adolfo, 4,330,432, Cl. 252-429.00C.

Zapparoli, Giorgio: *See*—
Tommasino, Luigi; and Zapparoli, Giorgio, 4,330,710, Cl. 250-472.000.

Zechmeister, Gerhard: *See*—
Kuhn-Kuhnenfeld, Franz; Kohl, Franz; Nemetz, Friedrich; and Zechmeister, Gerhard, 4,330,361, Cl. 156-617.0SP.

Zeeh, Bernd: *See*—
Acker, Rolf-Dieter; Buschmann, Ernst; Thym, Sabine; Zeeh, Bernd; and Pommer, Ernst-Heinrich, 4,330,535, Cl. 424-184.000.

Zeelen, Filippus J., to Akzo N.V. Ent-16-amino-17-hydroxy-oestra-1,3,5(10)-trienes and derivatives thereof, and pharmaceutical compositions. 4,330,540, Cl. 424-238.000.

Zeelen, Filippus J.: *See*—
Sleigh, Thomas; Savage, David S.; and Zeelen, Filippus J., 4,330,539, Cl. 424-238.000.

Zeh, Franz: *See*—
Deubner, Joachim; and Zeh, Franz, 4,330,354, Cl. 156-352.000.

Zehtner, Martin P. Reinforcing bar support for joining concrete structures. 4,329,825, Cl. 52-698.000.

Zeitraeg, Rolf, to Siemens Aktiengesellschaft. Apparatus for generating an exchange pulse train for use in a telecommunications system. 4,330,854, Cl. 370-100.000.

Zelezny, Eduard: *See*—
Boehm, Valter; Marosczyk, Veslav; Cieslar, Antonin; Bartuska, Miloslav; Rybak, Karel; Zverina, Karel; and Zelezny, Eduard, 4,330,568, Cl. 427-34.000.

Zerle, Ludwig; and Schmidt, Heinz, to Erhardt & Leimer KG. Method and apparatus for detwisting cloth. 4,329,838, Cl. 57-1.0UN.

Zetena, Maurice F., Jr.: *See*—
Friedman, Joshua; and Zetena, Maurice F., Jr., 4,330,274, Cl. 433-29.000.

Zimmerer, Arthur L., deceased: *See*—
Siekmeier, David A.; Andersen, Glen L.; Zimmerer, Arthur L., deceased; First National Bank and Trust Company, by, executor; and Zimmerer, William P., 4,330,085, Cl. 239-1.000.

Zimmerer, Bernadette, executor: *See*—
Siekmeier, David A.; Andersen, Glen L.; Zimmerer, Arthur L., deceased; First National Bank and Trust Company, by, executor; and Zimmerer, William P., 4,330,085, Cl. 239-1.000.

Zimmerer, William P.: *See*—
Siekmeier, David A.; Andersen, Glen L.; Zimmerer, Arthur L., deceased; First National Bank and Trust Company, by, executor; and Zimmerer, William P., 4,330,085, Cl. 239-1.000.

Zimpro-AEC Ltd.: *See*—
Soukup, Charles L.; and Kerr, Richard K., 4,330,038, Cl. 166-267.000.

Zirngibl, Ludwig; Fischer, Johanna; and Thiele, Kurt, to Siegfried Aktiengesellschaft. Heterocyclic imidazolyl vinyl ethers and use of same as fungicides or bactericides. 4,330,545, Cl. 424-263.000.

Zulehner, Werner, to Wacker-Chemitronic Gesellschaft fur Elektronik-Grundstoffe mbH. Device and process for pulling high-purity semiconductor rods from a melt. 4,330,362, Cl. 156-617.0SP.

Zumpe, Bernd: *See*—
Pietschmann, Frank; John, Gunter; Eistert, Theodor; Noack, Christian; Oliva, Klaus; Zumpe, Bernd; Spaida, Hans P.; Boltizar, Pal; Fabry, Istvan; Vida, Csongor; Lakos, Lajos; and Klement, Matjas, 4,329,832, Cl. 56-98.000.

Zurn Industries: *See*—
Doshi, Mahendra F.; Gruber, Martin V.; and Steinlein, Frederick R., 4,330,491, Cl. 261-111.000.

Zverina, Karel: *See*—
Boehm, Valter; Marosczyk, Veslav; Cieslar, Antonin; Bartuska, Miloslav; Rybak, Karel; Zverina, Karel; and Zelezny, Eduard, 4,330,568, Cl. 427-34.000.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 18TH DAY OF MAY, 1982

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Abe, Mitsunobu: *See*—
Toda, Kenzo; Gondo, Hisashi; Kawasaki, Bunichiro; Abe, Mitsunobu; Katsutani, Ryoseki; Kawano, Tsuyoshi; Uehara, Norimasa; Saito, Yoshio; Suemune, Kenichiro; Shiraishi, Masahiko; Tadashige, Yoshifumi; Morimoto, Masao; Tsukamura, Takao; Watanabe, Kurayoshi; and Nishimura, Teruhiko, Re. 30,933, Cl. 72-202.000.

d'Alayer de Costemore d'Arc, Stephane M.; and Hiley, John L., to Staar S.A. Transfer of a flexible web member from supply reel to a take-up reel. Re. 30,939, Cl. 318-7.000.

Deister Concentrator Company, Inc., The: *See*—
Stone, Spencer A., Re. 30,932, Cl. 74-61.000.

Elkem-Spigerverket a/s: *See*—
Krogsrud, Harald, Re. 30,937, Cl. 373-8.000.

Gondo, Hisashi: *See*—
Toda, Kenzo; Gondo, Hisashi; Kawasaki, Bunichiro; Abe, Mitsunobu; Katsutani, Ryoseki; Kawano, Tsuyoshi; Uehara, Norimasa; Saito, Yoshio; Suemune, Kenichiro; Shiraishi, Masahiko; Tadashige, Yoshifumi; Morimoto, Masao; Tsukamura, Takao; Watanabe, Kurayoshi; and Nishimura, Teruhiko, Re. 30,933, Cl. 72-202.000.

Hehl, Karl. Hydraulic drive for the die closing unit of an injection molding machine. Re. 30,934, Cl. 91-519.000.

Hiley, John L.: *See*—
d'Alayer de Costemore d'Arc, Stephane M.; and Hiley, John L., Re. 30,939, Cl. 318-7.000.

Joumas, George E.: *See*—
Kmetz, Edward R.; and Joumas, George E., Re. 30,936, Cl. 431-22.000.

Kallen, George H., to Union Carbide Corporation. Line edge follower. Re. 30,938, Cl. 250-202.000.

Katsutani, Ryoseki: *See*—
Toda, Kenzo; Gondo, Hisashi; Kawasaki, Bunichiro; Abe, Mitsunobu; Katsutani, Ryoseki; Kawano, Tsuyoshi; Uehara, Norimasa; Saito, Yoshio; Suemune, Kenichiro; Shiraishi, Masahiko; Tadashige, Yoshifumi; Morimoto, Masao; Tsukamura, Takao; Watanabe, Kurayoshi; and Nishimura, Teruhiko, Re. 30,933, Cl. 72-202.000.

Kawano, Tsuyoshi: *See*—
Toda, Kenzo; Gondo, Hisashi; Kawasaki, Bunichiro; Abe, Mitsunobu; Katsutani, Ryoseki; Kawano, Tsuyoshi; Uehara, Norimasa; Saito, Yoshio; Suemune, Kenichiro; Shiraishi, Masahiko; Tadashige, Yoshifumi; Morimoto, Masao; Tsukamura, Takao; Watanabe, Kurayoshi; and Nishimura, Teruhiko, Re. 30,933, Cl. 72-202.000.

Kawasaki, Bunichiro: *See*—
Toda, Kenzo; Gondo, Hisashi; Kawasaki, Bunichiro; Abe, Mitsunobu; Katsutani, Ryoseki; Kawano, Tsuyoshi; Uehara, Norimasa; Saito, Yoshio; Suemune, Kenichiro; Shiraishi, Masahiko; Tadashige, Yoshifumi; Morimoto, Masao; Tsukamura, Takao; Watanabe, Kurayoshi; and Nishimura, Teruhiko, Re. 30,933, Cl. 72-202.000.

Kmetz, Edward R.; and Joumas, George E., to Scotty Vent Dampers, Inc. Safety control for furnace burner. Re. 30,936, Cl. 431-22.000.

Krogsrud, Harald, to Elkem-Spigerverket a/s. Apparatus for gas collection in open electric smelting furnaces. Re. 30,937, Cl. 373-8.000.

Morimoto, Masao: *See*—
Toda, Kenzo; Gondo, Hisashi; Kawasaki, Bunichiro; Abe, Mitsunobu; Katsutani, Ryoseki; Kawano, Tsuyoshi; Uehara, Norimasa; Saito, Yoshio; Suemune, Kenichiro; Shiraishi, Masahiko; Tadashige, Yoshifumi; Morimoto, Masao; Tsukamura, Takao; Watanabe, Kurayoshi; and Nishimura, Teruhiko, Re. 30,933, Cl. 72-202.000.

Nippon Steel Corporation: *See*—
Toda, Kenzo; Gondo, Hisashi; Kawasaki, Bunichiro; Abe, Mitsunobu; Katsutani, Ryoseki; Kawano, Tsuyoshi; Uehara, Norimasa; Saito, Yoshio; Suemune, Kenichiro; Shiraishi, Masahiko; Tadashige, Yoshifumi; Morimoto, Masao; Tsukamura, Takao; Watanabe, Kurayoshi; and Nishimura, Teruhiko, Re. 30,933, Cl. 72-202.000.

Nishimura, Teruhiko: *See*—
Toda, Kenzo; Gondo, Hisashi; Kawasaki, Bunichiro; Abe, Mitsunobu; Katsutani, Ryoseki; Kawano, Tsuyoshi; Uehara, Norimasa; Saito, Yoshio; Suemune, Kenichiro; Shiraishi, Masahiko; Tadashige, Yoshifumi; Morimoto, Masao; Tsukamura, Takao; Watanabe, Kurayoshi; and Nishimura, Teruhiko, Re. 30,933, Cl. 72-202.000.

Richardson, Edwin A.; and Scheuerman, Ronald F., to Shell Oil Company. Method of starting gas production by injecting nitrogen-generating liquid. Re. 30,935, Cl. 166-300.000.

Saito, Yoshio: *See*—
Toda, Kenzo; Gondo, Hisashi; Kawasaki, Bunichiro; Abe, Mitsunobu; Katsutani, Ryoseki; Kawano, Tsuyoshi; Uehara, Norimasa; Saito, Yoshio; Suemune, Kenichiro; Shiraishi, Masahiko; Tadashige, Yoshifumi; Morimoto, Masao; Tsukamura, Takao; Watanabe, Kurayoshi; and Nishimura, Teruhiko, Re. 30,933, Cl. 72-202.000.

Sand, Robert H.: *See*—
Trachtenburg, Martin; and Sand, Robert H., Re. 30,930, Cl. 52-309.300.

Scheuerman, Ronald F.: *See*—
Richardson, Edwin A.; and Scheuerman, Ronald F., Re. 30,935, Cl. 166-300.000.

Scotty Vent Dampers, Inc.: *See*—
Kmetz, Edward R.; and Joumas, George E., Re. 30,936, Cl. 431-22.000.

Shell Oil Company: *See*—
Richardson, Edwin A.; and Scheuerman, Ronald F., Re. 30,935, Cl. 166-300.000.

Shiraishi, Masahiko: *See*—
Toda, Kenzo; Gondo, Hisashi; Kawasaki, Bunichiro; Abe, Mitsunobu; Katsutani, Ryoseki; Kawano, Tsuyoshi; Uehara, Norimasa; Saito, Yoshio; Suemune, Kenichiro; Shiraishi, Masahiko; Tadashige, Yoshifumi; Morimoto, Masao; Tsukamura, Takao; Watanabe, Kurayoshi; and Nishimura, Teruhiko, Re. 30,933, Cl. 72-202.000.

Staar S.A.: *See*—
d'Alayer de Costemore d'Arc, Stephane M.; and Hiley, John L., Re. 30,939, Cl. 318-7.000.

Stone, Spencer A., to Deister Concentrator Company, Inc., The. Vibrator device. Re. 30,932, Cl. 74-61.000.

Suemune, Kenichiro: *See*—
Toda, Kenzo; Gondo, Hisashi; Kawasaki, Bunichiro; Abe, Mitsunobu; Katsutani, Ryoseki; Kawano, Tsuyoshi; Uehara, Norimasa; Saito, Yoshio; Suemune, Kenichiro; Shiraishi, Masahiko; Tadashige, Yoshifumi; Morimoto, Masao; Tsukamura, Takao; Watanabe, Kurayoshi; and Nishimura, Teruhiko, Re. 30,933, Cl. 72-202.000.

Tadashige, Yoshifumi: *See*—
Toda, Kenzo; Gondo, Hisashi; Kawasaki, Bunichiro; Abe, Mitsunobu; Katsutani, Ryoseki; Kawano, Tsuyoshi; Uehara, Norimasa; Saito, Yoshio; Suemune, Kenichiro; Shiraishi, Masahiko; Tadashige, Yoshifumi; Morimoto, Masao; Tsukamura, Takao; Watanabe, Kurayoshi; and Nishimura, Teruhiko, Re. 30,933, Cl. 72-202.000.

Toda, Kenzo; Gondo, Hisashi; Kawasaki, Bunichiro; Abe, Mitsunobu; Katsutani, Ryoseki; Kawano, Tsuyoshi; Uehara, Norimasa; Saito, Yoshio; Suemune, Kenichiro; Shiraishi, Masahiko; Tadashige, Yoshifumi; Morimoto, Masao; Tsukamura, Takao; Watanabe, Kurayoshi; and Nishimura, Teruhiko, to Nippon Steel Corporation. Apparatus for continuous treatment of low-carbon cold-rolled steel sheet having excellent cold working properties. Re. 30,933, Cl. 72-202.000.

Trachtenburg, Martin; and Sand, Robert H. Glazing strip and method. Re. 30,930, Cl. 52-309.300.

Tsukamura, Takao: *See*—
Toda, Kenzo; Gondo, Hisashi; Kawasaki, Bunichiro; Abe, Mitsunobu; Katsutani, Ryoseki; Kawano, Tsuyoshi; Uehara, Norimasa; Saito, Yoshio; Suemune, Kenichiro; Shiraishi, Masahiko; Tadashige, Yoshifumi; Morimoto, Masao; Tsukamura, Takao; Watanabe, Kurayoshi; and Nishimura, Teruhiko, Re. 30,933, Cl. 72-202.000.

Uehara, Norimasa: *See*—
Toda, Kenzo; Gondo, Hisashi; Kawasaki, Bunichiro; Abe, Mitsunobu; Katsutani, Ryoseki; Kawano, Tsuyoshi; Uehara, Norimasa; Saito, Yoshio; Suemune, Kenichiro; Shiraishi, Masahiko; Tadashige, Yoshifumi; Morimoto, Masao; Tsukamura, Takao; Watanabe, Kurayoshi; and Nishimura, Teruhiko, Re. 30,933, Cl. 72-202.000.

Union Carbide Corporation: *See*—
Kallen, George H., Re. 30,938, Cl. 250-202.000.

Watanabe, Kurayoshi: *See*—
Toda, Kenzo; Gondo, Hisashi; Kawasaki, Bunichiro; Abe, Mitsunobu; Katsutani, Ryoseki; Kawano, Tsuyoshi; Uehara, Norimasa; Saito, Yoshio; Suemune, Kenichiro; Shiraishi, Masahiko; Tadashige, Yoshifumi; Morimoto, Masao; Tsukamura, Takao; Watanabe, Kurayoshi; and Nishimura, Teruhiko, Re. 30,933, Cl. 72-202.000.

Winter, Karl. Warp knitting machine with compound needles. Re. 30,931, Cl. 66-120.000.

LIST OF DESIGN PATENTEES

Adkinson, Joseph E. Stackable chair or the like. 264,405, 5-18-82, Cl. D6-76.000.

Aero Systems Research, Inc.: *See*—
Buck, Gaylord B., 264,480, Cl. D19-64.000.

Allibert S.A.: *See*—
Missir, Jean Y., 264,414, Cl. D6-234.000.

American Can Company: *See*—
Wathen, John M., Jr., 264,418, Cl. D7-28.000.

Anchor Hocking Corporation: *See*—
Pettengill, Floyd E., 264,430, Cl. D9-336.000.
Pettengill, Floyd E., 264,433, Cl. D9-385.000.
Pettengill, Floyd E., 264,434, Cl. D9-385.000.
Pettengill, Floyd E., 264,435, Cl. D9-385.000.
Pettengill, Floyd E., 264,436, Cl. D9-385.000.
Pettengill, Floyd E., 264,437, Cl. D9-385.000.

Anderson, Norman A. Fly. 264,490, 5-18-82, Cl. D22-27.000.

Antocks Lairn Limited: *See*—
Webb, Roger L., 264,403, Cl. D6-71.000.

Apache Chemicals, Inc.: *See*—
Jones, David E., 264,428, Cl. D9-374.000.

Arnold, Franz, to Trisa Burstenfabrik AG Triengen. Hairbrush or similar article. 264,400, 5-18-82, Cl. D4-35.000.

Arnott, John. Paper towel holder. 264,406, 5-18-82, Cl. D6-96.000.

Austin, John J., to Champion International Corporation. Container package. 264,440, 5-18-82, Cl. D9-431.000.

Auto Alloys R&D Limited: *See*—
Tutton, William G. G., 264,474, Cl. D15-126.000.

Avento Designs Inc.: *See*—
Di Persia, James, 264,413, Cl. D6-186.000.

Barr, Samuel J.; and Stuff, Alfred O. Golf putter head. 264,487, 5-18-82, Cl. D21-217.000.

Basili, Robert A.; Weinstein, Gerald; and Wilson, William B., to Plastic Reel Corporation of America. Video cassette storage container. 264,398, 5-18-82, Cl. D3-35.000.

Beaton, Darrow R. Heat retrieval unit. 264,500, 5-18-82, Cl. D23-136.000.

Beaton, Darrow R. Heat retrieval unit for installation into a flue duct. 264,501, 5-18-82, Cl. D23-136.000.

Beckerman, Kenneth; and Leusch, Michael, to Package Products, Inc. Storage or serving tray for flatware and condiments or the like. 264,420, 5-18-82, Cl. D7-73.000.

Berteloot, Joseph W. Antfarm. 264,511, 5-18-82, Cl. D30-1.000.

Bowhall, Gary O.: *See*—
Carlson, Richard B.; and Bowhall, Gary O., 264,472, Cl. D15-23.000.

Boyd, Raymond. Lighted compact. 264,510, 5-18-82, Cl. D28-78.000.

Brent, Rachael E. Guitar fretboard or the like. 264,477, 5-18-82, Cl. D17-20.000.

Buck, Gaylord B., to Aero Systems Research, Inc. Solar energy demonstrator. 264,480, 5-18-82, Cl. D19-64.000.

Butler, Edward A.; and Savoie, Francis R. Bicycle alarm. 264,451, 5-18-82, Cl. D10-106.000.

Carlson, Richard B.; and Bowhall, Gary O., to Steiger Tractor, Inc. Combined tractor cab and hood. 264,472, 5-18-82, Cl. D15-23.000.

Casado, John. Font of characters. 264,478, 5-18-82, Cl. D18-26.000.

Champion International Corporation: *See*—
Austin, John J., 264,440, Cl. D9-431.000.

Chapa, Amadeo. Pipeline protector. 264,494, 5-18-82, Cl. D23-40.000.

Clark, Hiram D. Grass extracting device. 264,424, 5-18-82, Cl. D8-13.000.

Coats & Clark, Inc.: *See*—
Einhorn, Ruediger, 264,426, Cl. D8-367.000.

Collins, Samuel T., to Trend Line Furniture Corporation. Table. 264,411, 5-18-82, Cl. D6-179.000.

Comello, Corrado: *See*—
Foscarini, Anthony; Foscarini, John; and Comello, Corrado, 264,429, Cl. D8-385.000.

Continental Group, Inc., The: *See*—
Hasegawa, Gary K., 264,439, Cl. D9-416.000.

Corner, Michael R., to Dunlop Limited. Tire. 264,457, 5-18-82, Cl. D12-147.000.

Corning Glass Works: *See*—
Dorman, William H.; and Smith, Jerome J., 264,419, Cl. D7-46.000.

Crawford, Joyce E. Flower plaque. 264,452, 5-18-82, Cl. D11-139.000.

Curtis, Frank, to Curtis Motor Modifications, Inc. Carburetor air intake heater. 264,495, 5-18-82, Cl. D23-77.000.

Curtis Motor Modifications, Inc.: *See*—
Curtis, Frank, 264,495, Cl. D23-77.000.

Davis, Arnold M.; and Schaum, David L., to International Business Machines Corporation. Document processing work station. 264,466, 5-18-82, Cl. D14-104.000.

Deibert, David D. Windmill generator. 264,470, 5-18-82, Cl. D15-1.000.

Di Persia, James, to Avento Designs Inc. Combined storage and display unit. 264,413, 5-18-82, Cl. D6-186.000.

Diskin, Stephen P. Clock. 264,442, 5-18-82, Cl. D10-22.000.

Diskin, Stephen P. Clock. 264,443, 5-18-82, Cl. D10-22.000.

Dorman, William H.; and Smith, Jerome J., to Corning Glass Works. Cutting board assembly or the like. 264,419, 5-18-82, Cl. D7-46.000.

Drutz, Alvin S.: *See*—
McKinnon, Eugene T.; and Drutz, Alvin S., 264,446, Cl. D10-50.000.

Dunlop Limited: *See*—
Corner, Michael R., 264,457, Cl. D12-147.000.
Hart, Claude A., 264,455, Cl. D12-146.000.
Ingley, Peter, 264,456, Cl. D12-146.000.

Durr Dental GmbH and Co., KG: *See*—
Muller, Mathias; and Schmidtchen, Gerhard, 264,502, Cl. D24-2.000.

Eichenberger, Walter: *See*—
Muchenberger, Ernest; and Eichenberger, Walter, 264,444, Cl. D10-46.000.

Einhorn, Ruediger, to Coats & Clark, Inc. Hook. 264,426, 5-18-82, Cl. D8-367.000.

Ekco Products, Inc.: *See*—
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Fujita, Makoto; Hino, Izumi; and Ohmiya, Shoji, to Matsushita Electric Industrial Co., Ltd. Record disc package. 264,397, 5-18-82, Cl. D3-35.000.

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Hasegawa, Gary K., to Continental Group, Inc., The. Food can or the like. 264,439, 5-18-82, Cl. D9-416.000.

Hengle, Frank. Game board. 264,484, 5-18-82, Cl. D21-27.000.

Henkels, Walter. Tape measure. 264,447, 5-18-82, Cl. D10-72.000.

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Hoshino, Kunio; and Hamada, Masanori, to Matsushita Electric Industrial Co., Ltd. Combined radio receiver and cassette tape recorder. 264,461, 5-18-82, Cl. D14-5.000.

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Pettengill, Floyd E., to Anchor Hocking Corporation. Jar or similar article. 264,434, 5-18-82, Cl. D9-385.000.
Pettengill, Floyd E., to Anchor Hocking Corporation. Jar or similar article. 264,435, 5-18-82, Cl. D9-385.000.
Pettengill, Floyd E., to Anchor Hocking Corporation. Jar or similar article. 264,436, 5-18-82, Cl. D9-385.000.
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Warriner, William A., to Jackson & Perkins Company. Rose plant 71-11223. 4,848, 5-18-82, Cl. 23.000.

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1 UN 4,329,838
263 4,329,839
279 4,329,840
288 4,329,841

CLASS 60

39.46 G 4,329,842
274 4,329,843
311 4,329,844
422 4,329,845
562 4,329,846
648 4,329,847
757 4,329,848

CLASS 62

23 4,330,307
40 4,330,308
55 4,329,849
63 4,329,850
101 4,329,851
181 4,330,309
256 4,329,852
275 4,330,310
308 4,329,853
470 4,329,854
473 4,329,855

CLASS 65

1 4,330,311
4,330,312
2 4,330,313
27 4,330,314
4,330,315
4,330,316
29 4,330,317
60 C 4,330,318

CLASS 66

120 Re.30,931

CLASS 68

12 R 4,329,858
23 R 4,329,859

CLASS 70

164 4,329,860

CLASS 71

28 4,330,319
94 4,330,320
4,330,321
96 4,330,322
100 4,330,323
105 4,330,324

CLASS 72

14 4,329,861
53 4,329,862
202 Re.30,933
205 4,329,863
239 4,329,864
389 4,329,865
405 4,329,866
455 4,329,867

CLASS 73

19 4,329,868
4,329,869
23 4,329,870
35 4,329,871
49.5 4,329,872
190 CV 4,329,873
4,329,874
290 V 4,329,875
618 4,329,876
706 4,329,877
766 4,329,878
861.12 4,329,879
861.24 4,329,880
862.08 4,329,881
864.44 4,329,882
864.52 4,329,883

CLASS 74

5.6 D 4,329,884
61 Re.30,932
339 4,329,885
416 4,329,886
467 4,329,887
689 4,329,888
858 4,329,889

CLASS 75

36 4,330,325
60 4,330,326
76 4,330,327
4,330,328
203 4,330,332
244 4,330,333

CLASS 81

7 4,329,890
9.5 A 4,329,891
55 4,329,892

CLASS 83

24 4,329,893
156 4,329,894
174 4,329,895
210 4,329,896
225 4,329,897
251 4,329,898
320 4,329,899
355 4,329,900
819 4,329,901

CLASS 84

1.25 4,329,902
186 R 4,329,903
306 4,329,904
411 R 4,329,905

CLASS 86

36 4,329,906

CLASS 89

12 4,329,907
24 4,329,908
46 4,329,909

CLASS 91

375 R 4,329,910
387 4,329,911
420 4,329,912
519 Re.30,934

CLASS 92

71 4,329,913
105 4,329,914
137 4,329,915
240 4,329,916

CLASS 98

2.14 4,329,917

CLASS 99

276 4,329,918
359 4,329,919
450.4 4,329,920

CLASS 101

93.02 4,329,921
248 4,329,922
365 4,329,923

CLASS 102

202.8 4,329,924
310 4,329,925

CLASS 104

179 4,329,926

CLASS 105

462 4,329,927

CLASS 106

90 4,330,334
99 4,330,335
104 4,330,336
135 4,330,337
197 C 4,330,338
243 4,330,339
281 R 4,330,340
308 N 4,330,341

CLASS 108

106 4,329,928

CLASS 110

171 4,329,929
175 R 4,329,930
346 4,329,931
347 4,329,932

CLASS 112

158 E 4,329,933
226 4,329,934

CLASS 114

72 4,329,935
345 4,329,751

CLASS 118

100 4,329,936
105 4,329,937
730 4,329,938

CLASS 119

28 4,329,939
72 4,329,940
72.5 4,329,941
96 4,329,942

CLASS 122

17 4,329,943

CLASS 123

3 4,329,944
25 B 4,329,945
41.49 4,329,946
41.74 4,329,947
73 AA 4,329,948
90.34 4,329,949
149 C 4,329,950
179 L 4,329,951
196 AB 4,329,952
198 B 4,329,953
198 D 4,329,954
260 4,329,955
286 4,329,956
378 4,329,957
387 4,329,958
416 4,329,959
436 4,329,960
502 4,329,961
4,329,962
552 4,329,963
557 4,329,964
569 4,329,965
572 4,329,966
573 4,329,968
585 4,329,969
618 4,329,970

CLASS 124

3 4,329,971
24 R 4,329,972

CLASS 126

123 4,329,973
164 4,329,974
192 4,329,975
293 4,329,967
312 4,329,976
369 4,329,977
417 4,329,978
422 4,329,979

CLASS 128

4 4,329,980
25 B 4,329,981
80 E 4,329,982
207.14 4,329,983
4,329,984
214 R 4,329,985
4,329,986
4,329,987
218 F 4,329,988
218 R 4,329,989
239 4,329,990
263 4,329,991
272 4,329,992
349 B 4,329,993
4,329,994
350 R 4,329,995
359 4,329,996
402 4,329,997
760 4,329,999

CLASS 130

27 L 4,330,000

CLASS 131

108 4,330,001
365 4,330,002

CLASS 132

89 4,330,014

CLASS 134

13 4,330,342

CLASS 136

247 4,330,680

CLASS 137

100 4,330,003
343 4,330,004
355.28 4,330,005
514 4,330,006
565 4,330,007
596.13 4,330,008
4,330,009
614.06 4,330,010
625.17 4,330,011
625.48 4,330,012
637.1 4,330,013

CLASS 138

109 4,330,015
4,330,016
126 4,330,017

CLASS 139

439 4,330,018

CLASS 144

312 4,330,019

CLASS 148

1.5 4,330,343
2 4,330,331
6.15 Z 4,330,345
6.2 4,330,344
31.5 4,330,347
111 4,330,348
430 4,330,330

CLASS 149

21 4,330,346

CLASS 156

72 4,330,349
152 4,330,350
203 4,330,351
235 4,330,352
314 4,330,353
352 4,330,354
361 4,330,355
446 4,330,356
584 4,330,357
603 4,330,358
608 4,330,359
610 4,330,360
617 SP 4,330,361
4,330,362
620 4,330,363

CLASS 159

47 R 4,330,364

CLASS 160

90 4,330,020
91 4,330,021
379 4,330,022

CLASS 162

168 NA 4,330,365
358 4,330,023

CLASS 164

56.1 4,330,024
423 4,330,025
457 4,330,026
461 4,330,027

CLASS 165

1 4,330,028
8 4,330,029
67 4,330,030
76 4,330,031
94 4,330,032
104.27 4,330,033
113 4,330,034
164 4,330,035
179 4,330,036

CLASS 166

250 4,330,037
267 4,330,038
297 4,330,039
300 Re.30,935

CLASS 169

13 4,330,040

CLASS 172

566 4,330,041
621 4,330,042

CLASS 174

14 R 4,330,681
4,330,682
52 FP 4,330,683
68.5 4,330,684
101.5 4,330,685

CLASS 175

406 4,330,043
410 4,330,044

CLASS 179

1 A 4,330,686
2 DP 4,330,687
8 A 4,330,688
15.55 R 4,330,689
81 A 4,330,690
146 E 4,330,691
178 4,330,692

CLASS 180

65 F 4,330,045

CLASS 181

210 4,330,046
224 4,330,047

CLASS 186

66 4,330,048

CLASS 188

73.36 4,330,049

CLASS 190

51 4,330,050

CLASS 192

3 N 4,330,051
4 C 4,330,053
35 4,330,054
148 4,330,052

CLASS 198

334 4,330,057
474 4,330,055
860 4,330,056

CLASS 200

1 R 4,330,693
6 A 4,330,694
83 P 4,330,695

CLASS 201

41 4,330,372

CLASS 202

174 4,330,373

CLASS 203

12 4,330,374

CLASS 204

35 R 4,330,375
47 4,330,376
93 4,330,377
104 4,330,378
119 4,330,379
123 4,330,380
129.6 4,330,381
157.1 R 4,330,382
159.13 4,330,383
192 E 4,330,384
195 R 4,330,385
223 4,330,386
275 4,330,387

CLASS 206

150 4,330,058
423 4,330,059
459 4,330,060

CLASS 208

8 LE 4,330,388
10 4,330,389
4,330,390
4,330,391
4,330,392
4,330,393
23 4,330,394
115 4,330,395
136 4,330,396
149 4,330,397

CLASS 209

3.1 4,330,061
166 4,330,398
214 4,330,399
474 4,330,400
582 4,330,062
608 4,330,063
617 4,330,064

CLASS 210

106 4,330,401
170 4,330,402
221.2 4,330,403
247 4,330,404
331 4,330,405
500.2 4,330,406
602 4,330,407
619 4,330,408
731 4,330,409
767 4,330,410
769 4,330,411
805 4,330,412
806 4,330,413

CLASS 211

60 SK 4,330,065

CLASS 215

1 C 4,330,066
220 4,330,067

CLASS 219

10.55 A 4,330,698
10.55 F 4,330,696
4,330,697
121 LD 4,330,699
121 PP 4,330,700
450 4,330,701
492 4,330,702
553 4,330,703
4,330,704

CLASS 220

4 B 4,330,068
203 4,330,069
229 4,329,857

CLASS 222

43 4,330,070
207 4,330,071
209 4,330,072

CLASS 224

223 4,330,073

CLASS 228

29 4,330,074
53 4,330,075
119 4,330,076
139 4,330,077

CLASS 229

15 4,330,078
40 4,330,079

CLASS 233

27 4,330,080

CLASS 236

12 R 4,330,081
13 4,330,082

CLASS 237

12.1 4,330,084
56 4,330,083

CLASS 239

1 4,330,085
8 4,330,086
233 4,330,087
318 4,330,088
383 4,330,089

CLASS 241

14 4,330,090
73 4,330,091
232 4,330,092

CLASS 242

7.17 4,330,093
36 4,330,094
74.1 4,330,096
129.5 4,330,095
187 4,330,097
201 4,330,098

CLASS 244

3.13 4,330,099
48 4,330,100

CLASS 248

284 4,330,101
459 4,330,102
548 4,330,103

CLASS 250

202 Re.30,938
203 R 4,330,705
214 AL 4,330,706
311 4,330,707
396 ML 4,330,708
4,330,709
472 4,330,710
506 4,330,711
572 4,330,712

CLASS 252

8.5 A 4,330,414
8.55 B 4,330,419
8.55 D 4,330,418
8.6 4,330,415
8.9 4,330,416
4,330,417
32.7 E 4,330,420
42.7 4,330,421
89.1 4,330,422
99 4,330,423
135 4,330,424
187 H 4,330,425
299.63 4,330,426
301.24 4,330,427
359 CG 4,330,428
413 4,330,429
420 4,330,430
429 B 4,330,431
4,330,433
429 C 4,330,432
430 4,330,434
455 Z 4,330,435
466 J 4,330,436
476 4,330,437
552 4,330,438
570 4,330,439

CLASS 254

89 R 4,330,105
93 H 4,330,104

CLASS 256

13.1 4,330,106

CLASS 260

112 B 4,330,463
112 R 4,330,464
112.5 E 4,330,465
112.5 R 4,330,466
155 4,330,467
198 4,330,468
242.2 4,330,469
245.84 4,330,470
393 4,330,476
429.7 4,330,477
439 R 4,330,478
453 P 4,330,479
458 R 4,330,480
463 4,330,481
465 G 4,330,482
465.8 R 4,330,483
501.17 4,330,484
502 R 4,330,485
502.4 P 4,330,486
502.5 4,330,487
511 4,330,488
544 F 4,330,366

CLASS 261

44 C 4,330,489
62 4,330,490
111 4,330,491
145 4,330,492

CLASS 264

22 4,330,493
46.2 4,330,494
54 4,330,495
57 4,330,496
150 4,330,497
251 4,330,498
289.6 4,330,499
554 4,330,500
566 4,330,501

CLASS 266

44 4,330,107
47 4,330,108
67 4,330,109
70 4,330,110
106 4,330,111
115 4,330,112

CLASS 269

88 4,330,113

CLASS 271

22 4,330,114
124 4,330,115
178 4,330,116
235 4,330,117

CLASS 272

75 4,330,118
76 4,330,119
119 4,330,120

CLASS 273

26 B 4,330,121
51 4,330,122
54 B 4,330,123
67 B 4,330,124
73 C 4,330,125
73 D 4,330,132
80 R 4,330,126
86 B 4,330,127
173 4,330,128
372 4,330,129
393 4,330,130
413 4,330,131

CLASS 277

26 4,330,133
42 4,330,134
102 4,330,135
228 4,330,136

CLASS 280

238 4,330,137
630 4,330,138
777 4,330,139

CLASS 285

39 4,330,140
93 4,330,141
256 4,330,142
322 4,330,143
382.5 4,330,144

CLASS 290

48 4,330,713
55 4,330,714

CLASS 292

37 4,330,145
258 4,330,146
259 R 4,330,147

CLASS 296

97 C 4,330,148
190 4,330,149
218 4,330,150

CLASS 297

157 4,330,151
465 4,330,152

CLASS 299

1 4,330,153
4,330,154
11 4,330,155
37 4,330,156

CLASS 303

7 4,330,157

CLASS 307

10 LS 4,330,716
10 R 4,330,715
46 4,330,717
118 4,330,718
238.3 4,330,719
270 4,330,720
425 4,330,721
443 4,330,722
456 4,330,723

CLASS 308

8.2 4,330,158
9 4,330,159
201 4,330,160

CLASS 310

49 R 4,330,724
82 4,330,725
254 4,330,726
268 4,330,727
313 B 4,330,728
322 4,330,729
331 4,330,730

CLASS 312

9 4,330,161
15 4,330,162

CLASS 313

104 4,330,731
130 4,330,732
386 4,330,733
390 4,330,734
422 4,330,735

CLASS 315

209 R 4,330,736
241 P 4,330,737

CLASS 318

7 Re.30,939
128 4,330,738
696 4,330,739
780 4,330,740
803 4,330,741

CLASS 320

14 4,330,742

CLASS 322

10 4,330,743

CLASS 323

316 4,330,744

CLASS 324

71 CP 4,330,745
78 D 4,330,746
150 4,330,747
225 4,330,748
457 4,330,749

CLASS 328

55 4,330,750
61 4,330,751
134 4,330,752

CLASS 329

50 4,330,753

CLASS 330

264 4,330,754
271 4,330,755
297 4,330,756
298 4,330,757

CLASS 331

1 A 4,330,758
14 4,330,759
55 4,330,760

CLASS 333

18 4,330,764
81 A 4,330,765
105 4,330,766
150 4,330,767
153 4,330,768
165 4,330,769

CLASS 335

112 4,330,770
205 4,330,771

CLASS 337

43 4,330,772
365 4,330,773

CLASS 339

17 CF 4,330,163
49 R 4,330,164
59 M 4,330,165
143 R 4,330,166
147 P 4,330,167
276 T 4,330,168

CLASS 340

58 4,330,774
146.3 P 4,330,775
365 R 4,330,776
635 4,330,777
642 4,330,778
705 4,330,779
825.44 4,330,780

CLASS 343

5 DP 4,330,781
715 4,330,782
749 4,330,783
771 4,330,784

CLASS 346

1.1 4,330,785
76 PH 4,330,786
140 R 4,330,787
157 4,330,788
161 4,330,789

CLASS 350

9 4,330,169
96.16 4,330,170
96.21 4,330,171
4,330,172
96.23 4,330,173
4,330,174
162 R 4,330,175
252 4,330,176
311 4,330,177
358 4,330,178
422 4,330,179
427 4,330,180
4,330,181

CLASS 352

2 4,330,182
206 4,330,183

CLASS 354

81 4,330,184
86 4,330,185
106 4,330,186
195 4,330,187
200 4,330,188
202 4,330,189
275 4,330,190
286 4,330,192
345 4,330,191

CLASS 355

3 DD 4,330,193
3 R 4,330,194
4,330,195
8 4,330,196
14 CH 4,330,199
14 D 4,330,198
14 SH 4,330,197
24 4,330,200
50 4,330,201

CLASS 356

1 4,330,202
127 4,330,203
152 4,330,204
237 4,330,205
246 4,330,206
318 4,330,207
4,330,208
328 4,330,209
4,330,210
354 4,330,211
4,330,212
355 4,330,213

CLASS 357

70 4,330,790

CLASS 358

8 4,330,791
33 4,330,792
56 4,330,793
120 4,330,794
127 4,330,795
213 4,330,796
224 4,330,797
291 4,330,798

CLASS 360

40 4,330,799
66 4,330,800
69 4,330,801
96.6 4,330,802
99 4,330,803
102 4,330,804
105 4,330,805
106 4,330,806
119 4,330,807

CLASS 361

25 4,330,808
103 4,330,809
189 4,330,810
212 4,330,811
386 4,330,812

CLASS 362

4 4,330,821
244 4,330,813
267 4,330,814

CLASS 363

35 4,330,815
56 4,330,816
96 4,330,817
126 4,330,818
132 4,330,819
135 4,330,820

CLASS 364

200 4,330,822
4,330,823
4,330,824
4,330,825
4,330,826
428 4,330,827
431 4,330,828
434 4,330,829
436 4,330,830
474 4,330,831
4,330,832
515 4,330,833
521 4,330,834
560 4,330,835
567 4,330,836
4,330,837
580 4,330,838
705 4,330,840
706 4,330,839
784 4,330,841
900 4,330,842
4,330,843
4,330,844
4,330,845
4,330,846
4,330,847

CLASS 365

32 4,330,848
181 4,330,849
185 4,330,850
202 4,330,851
221 4,330,852
227 4,330,853

CLASS 366

78 4,330,214
99 4,330,215
222 4,330,216

CLASS 367

14 4,330,871
43 4,330,872
60 4,330,873
103 4,330,874
105 4,330,875
4,330,876

CLASS 368

67 4,330,877
250 4,330,878

CLASS 369

32 4,330,879
4,330,880
50 4,330,881
55 4,330,882
100 4,330,883
255 4,330,884

CLASS 370

17 4,330,885
62 4,330,886
100 4,330,854
4,330,855
102 4,330,856
104 4,330,857

CLASSIFICATION OF PATENTS

111 4,330,858
113 4,330,859

CLASS 371

37 4,330,860

CLASS 372

4 4,330,761
41 4,330,763
85 4,330,762

CLASS 373

8 Re.30,937

CLASS 375

15 4,330,861
75 4,330,862
81 4,330,863

CLASS 376

133 4,330,864
200 4,330,370
245 4,330,367
249 4,330,865
258 4,330,371
268 4,330,369
460 4,330,368

CLASS 400

64 4,330,217
144.2 4,330,218
690.4 4,330,219

CLASS 401

134 4,330,220

CLASS 403

218 4,330,221

CLASS 405

48 4,330,222
63 4,330,223
115 4,330,224
160 4,330,225
291 4,330,226

CLASS 407

36 4,330,227

CLASS 408

112 4,330,228
212 4,330,229

CLASS 411

55 4,330,230

CLASS 414

24.5 4,330,231
267 4,330,232
310 4,330,233

CLASS 415

171 4,330,234

CLASS 416

96 R 4,330,235
198 A 4,330,236

CLASS 417

2 4,330,237
19 4,330,238
312 4,330,239

CLASS 418

1 4,330,240
132 4,330,241

CLASS 420

511 4,330,329

CLASS 422

142 4,330,502
177 4,330,503
205 4,330,504
217 4,330,505
305 4,330,506

CLASS 423

2 4,330,507
42 4,330,508
85 4,330,509
210 4,330,510
4,330,511
244 4,330,512
245 4,330,513
309 4,330,514
316 4,330,515
321 R 4,330,517
321 S 4,330,516
329 4,330,518
335 4,330,519
392 4,330,520
473 4,330,521
573 G 4,330,522
579 4,330,523
593 4,330,524
636 4,330,525

CLASS 424

70 4,330,526
94 4,330,527
101 4,330,528
114 4,330,529
131 4,330,530
149 4,330,531
177 4,330,532
181 4,330,533
182 4,330,534
184 4,330,535
200 4,330,536
204 4,330,537
238 4,330,538
4,330,539
4,330,540
243 4,330,541
248.5 4,330,542
248.56 4,330,543
4,330,544
263 4,330,545
4,330,546
4,330,547
4,330,548
267 4,330,549
273 R 4,330,550
4,330,551
285 4,330,552
4,330,553
4,330,554
309 4,330,555
4,330,556
316 4,330,557
319 4,330,558
4,330,559

CLASS 425

64 4,330,242
111 4,330,243
115 4,330,244
126 S 4,330,245
140 4,330,246
174.8 E 4,330,247
183 4,330,248
329 4,330,249
389 4,330,250
405 H 4,330,251
412 4,330,252
437 4,330,253
466 4,330,254
529 4,330,255
537 4,330,256
556 4,330,257
564 4,330,258

CLASS 426

7 4,330,560
140 4,330,561
310 4,330,562
389 4,330,563
417 4,330,564
431 4,330,565
606 4,330,566

CLASS 427

32 4,330,567
34 4,330,568
38 4,330,569
54.1 4,330,570
120 4,330,571
140 4,330,572
213 4,330,573
255.1 4,330,576
319 4,330,574
376.3 4,330,575

CLASS 428

13 4,330,578
35 4,330,579
36 4,330,577
43 4,330,580
64 4,330,581
4,330,582
65 4,330,583
91 4,330,584
131 4,330,585
196 4,330,586
215 4,330,587
264 4,330,588
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